THE CULTIVATOR:

A MONTHLY PUBLICATION, DEVOTED TO AGRICULTURE.

I KNOW OF NO PURSUIT IN WHICH MORE REAL AND IMPORTANT SERVICES CAN BE RENDERED TO ANY COUNTRY, THAN BY IMPROVING ITS AGRICULTURE — *Wash.*

VOL. V. NO. 3, WASHINGTON-ST. ALBANY, N. Y. OCTOBER, 1838. No. 8.

Conducted by J. BUEL, of Albany.

TERMS.—ONE DOLLAR per annum, to be paid in advance. Subscriptions to commence with a volume.

Special Agents.—L. & R. HILL, Richmond, Va.; BELL & ENTWISLE, Alexandria, D. C.; GIDEON B. SMITH, Baltimore, Md.; JUDAH DOBSON, bookseller, D. LANDREITH, and M. S. POWELL, seedsmen, Philadelphia; ISRAEL POST, bookseller, 83 Bowery, ALEX. SMITH, seedsman, P. WAKEMAN, office of the American Institute, Broadway, N. York; HOVEY & Co. Merchants' Row, Boston; ALEX. WALSH, Lansingburgh, and WM. THORBURN, Albany, gratuitous agents. For general list of agents see No. 12, vol. iv.

The Cultivator is subject to common newspaper postage.

☞ Price of the published volumes, 50 cents per vol. stitched—the four volumes bound together, $2.75—bound in two volumes, $3—the four vols bound each separate, $3.25.

THE CULTIVATOR.

TO IMPROVE THE SOIL AND THE MIND.

☞ **Farmers' Directory.** ☜

☞ We receive almost daily inquiries for seeds, implements, farm stock, &c. many of which it is difficult, and some of them out of our power, to answer satisfactorily. The expense of making and answering these inquiries amounts to no little in the aggregate. To remedy this inconvenience, and to render a service to the seller and buyer, we propose to insert in the extra which will accompany our February number, a FARMERS' DIRECTORY, that is, to give the names, residence and business, so far as they shall be notified to us by the 10th January, free of charge, of gentlemen engaged in vending agricultural seeds, implements, and choice breeds of farm stock, in whatever state they may reside. As for example,

W. Thorburn, Albany, vends seeds and implements.

H. D. Grove, Buskirk's Bridge, Washington co. N. Y. will sell 100 Saxony sheep.

G. B. Smith, Baltimore, Md. sells Rohan Potatoes and Dutton seed corn.

To the patrons of the Cultivator, no charge will be made for this notice—to others, it will be one dollar. Advertisements, more in detail, will be inserted in a separate portion of the same sheet, on our usual terms. The advantages that are likely to result to advertisers, may be judged from the fact, that our edition is twenty thousand copies, and that our paper circulates in every state and territory in the Union, and in the Canadas.

The Farmer's Garden.

FRUIT.

The fruit *trees* that may be cultivated in a garden, where the climate and soil will admit of their growth, are the apple, pear, plum, cherry, peach, nectarine and apricot; the fruit *shrubs*, are the quince, gooseberry, currant, raspberry; to which we may add the grape and the strawberry.

Each of these fruits may be profitably cultivated for market, where a market is contiguous or convenient; and they may all be made subservient to the economical subsistence of the owner's family, to a certain extent,—and certainly furnish some of the most grateful, and at the same time healthful delicacies and luxuries of the table. Hence the extent of their culture may be made to depend upon the demand.

It will be seen in the plan of a garden presented in our last, that nearly one-half, or half an acre, is appropriated to fruit *trees* and grape *vines*. Plats Nos. 8 and 9, will contain each 15 trees, at 12 feet apart, with intervals of five feet between the outside trees and the walks, and a trellis of grape vines along the southern borders of both plats. Numbers 10 and 11 will each receive 20 trees, at nearly similar distances. Thus the fruit department may contain 70 trees, and 20 grape vines, without materially interfering with the vegetable or ornamental departments.

The next question is, with what fruits shall these plats be planted? This depends upon another question—what fruits will thrive and mature in the soil and climate? The apple will admit of general culture; for although Coxe has fixed the northern border of the apple zone in the valley of the Mohawk, this fruit is nevertheless found in high perfection as far as lat. 45°, and even on the island of Montreal. And the defects of soil, it is believed, may in most cases be corrected, by underdraining and trenching. The plum, pear and cherry, do not do well in high northern latitudes, though they are grown to some extent on the borders of the lakes, upon our northern frontier. The peach is not successfully cultivated north of 42° upon tide-water, until we get west into the valley of the Seneca river, and within the influence of the predominating south winds, which come from the Gulph of Mexico. These winds are believed to be the trade-winds of the tropics, turned out of their western course by the high table lands of Mexico; and their mild influence is felt, more or less, as far north as the island of Montreal. The nectarine and apricot, so far as our observation has gone, seldom repay the expense of culture north of the city of New-York, unless protected by glass. The grape, even the hardier varieties, seldom ripens well north of 43°, and the fruit of the foreign varieties is very subject to be destroyed by mildew, or to lack fine flavor, unless secured in a house.

But supposing all the fruits we have named may be cultivated, we would appropriate the northern row in plats 8 and 9, to early apples, suitable for the kitchen and dessert; and instead of ten we would plant but six trees, which would give intervals between the trees of about 20 feet. As the apple is the largest growing tree, we would plant it on the north, as its shade, in that position, will be least prejudicial to other garden crops. The fruit never comes amiss in the family; if there is any excess, it is readily converted into pork; and if early apples are grown in the garden enclosure, they are most safe from depredations, and more convenient when wanted.

The next, in the size of fruit trees, are the cherry and the pear, and these may be made to occupy the other two rows in the plats under consideration; and as these should have intervals of at least 15 feet, the space will admit of but 16 instead of 20 trees. Should grapes not be made to occupy the place assigned them in these plats, the intervals, north and south, may be extended to 15 feet; or the spare strip may be profitably appropriated to nursery rows, to supply trees and shrubs to replace those which may fail or die, for the propagation of new varieties, and as a school of instruction in budding and grafting.

Plats 10 and 11, may be appropriated to the smaller growing trees, as plum, peach, &c. and will each contain 20; or the nursery may occupy a part of this ground. The rows of the nursery should be three feet asunder, and the plants one foot apart.

Many persons, to avoid the trivial expense demanded for good fruit, content themselves with seedlings, or inferior kinds, which they can obtain without price. This is bad policy. Good fruit is pleasant, healthy and profitable. Bad fruit has neither of these properties to recommend it. We have seen a cherry tree whose fruit had brought its owner fifty dollars; a pear tree which yielded its proprietor twenty dollars every bearing year; and plums which have readily commanded five dollars a bushel in the market. And we have seen other trees that virtually brought no profit to their owners, or food to the family, for the reason, that the fruit they produced was actually worth nothing. The catalogue of the London Horticultural Society, contains the names of more than 1,400 varieties of the apple, 700 of the pear, and nearly a like number of the peach, plum, &c. These fruits are arranged in three classes, according to quality: No. 1 being very good; No. 2 so so; and No. 3 comparatively worthless. Probably not more than one-tenth of these fruits belong to the first class.—We mention this fact to show, that superior fruits bear but a small proportion to the inferior kinds which are cultivated. An outlay of a few shillings in the purchase of good fruit in the outset, will, when the trees come into bearing, annually and amply compensate for the expense; and when once obtained, good fruits may be as easily propagated in the garden nursery as bad fruits. Young men, of ordinary capacity, *can* acquire the art of propagating, if they will but try, after a little practice.

The quince, the currant, the gooseberry and the raspberry, may occupy the east and part of the south border. The first should be planted 8, and the others 4 feet asunder. The strawberry may be grown in the southern edge of the fruit plats, or be assigned a place in the outer borders.

In recommending varieties of fruit for garden culture, we shall name such as we *know* to be good, without meaning to say that other varieties are not equally so. Every district of country has some kinds peculiar to itself. Besides, a list of all the good fruits would swell our article to a tedious and useless length. We therefore content ourselves with naming but a few varieties of each. But we remark, that new varieties are every year produced by the natural process of crossing. On a late visit to our friend I. Denniston, Esq. who perhaps has the best collection of plums of any man in America, he gave us to taste some fifteen new seedling varieties of this fruit, all of exquisite flavor.

EARLY APPLES.

Juneating, tart bough or harvest apple, strawberry apple, sapson, early French reinette, pumpkin sweeting, fall pippin, and for baking, the sweet bough, or Jersey sweeting. The apple should be raised from seed, and choice kinds may be multiplied in the garden nursery, by grafting or budding. Graft in April, and bud in July and August. Bud when the plants are the size of the little finger. For directions see the Cultivator, vol. II. p. 18, 65, 66.

PEARS.

We name those that ripen at different times, and in the order in which they ripen: Jargonelle and Williams' bonchretian for summer; autumn, or Gansell's bergamot, vergaleu, capiaumont, seckle, &c. for autumn; beurre diel, chaumontelle, colmar, easter beurre, &c. for winter; catillac or bell, for baking. The pear may be propagated and worked like the apple. If dwarf trees are desired, they may be worked upon stocks of the quince or thorn, at the surface of the ground.

CHERRIES.

We would have among these the morello, mayduke, black heart, white heart and late duke—the common red cherry should also have a place here, or in some other part of the premises. The cherry is generally budded, and this should be done in June, or while the plants are in thrifty growth.

PLUMS.

The green, purple, yellow, Bleecker's, Flushing and blue gages, are all excellent, as are the Bolmar, Nectarine, Orleans, St. Catharines, Jefferson, and many others. The egg and magnum bonum, belong to the second class as to flavor, though they are of the first class in size. Plums are propagated by budding and grafting; often upon succors which grow from the roots of old trees, though better stocks are readily obtained from seeds. The plum should be budded in June, or early in July—grafted in April.

PEACHES.

These are generally short-lived trees, and where they can be raised and fruited well, a supply of young trees should be constantly kept up in the nursery.—The peach should always be budded, as not one seedling in fifty turns out good fruit. The stones may be buried in the ground during winter, and those that are not cracked by the frost should be broken before they are planted. They may be sown thick, like cabbages, in a seed bed, and like cabbages transplanted into nursery rows with a dibble, when they have grown six inches high. They *may* be budded early in September, the same year, and *should* be budded as early as the second year. There is no fruit more easy of propagation, or that comes earlier into bearing, than the peach; and where it thrives well, there is no apology for neglecting its culture, or for not propagating the choice varieties; and nearly all that are worked in nurseries are of this description.

QUINCES

May be propagated by layers, by cuttings, or by seeds. Seeds may be sown like apples and pears, and transplanted when of sufficient size, in two or three years. The apple shaped, the pear shaped, and the Portugal quinces, are the principal varieties, of which the latter is generally preferred. It is of a fine purple colour when dressed, and is more juicy and less harsh than the other kinds.

GRAPES.

The Isabella, Catawba and Bland's Virginia, are the most esteemed native varieties; and the Sweetwater, Chasselas and black Hamburgh, the best foreign varieties, for culture in the open ground. The grape is propagated by layers and cuttings. For the management of the vines, see the directions of Alden Spooner, in the May number of the current volume. It is considered prudent in the climate of Albany, to lay grape vines, in autumn, upon the ground, even of the Isabella, and slightly to cover them with earth, after being previously pruned.

CURRANTS

Are a valuable fruit in family economy, are a long time in use, and are a marketable crop. New plantations of this fruit should be made every ten or a dozen years, as old wood becomes diseased, the ground upon which it grows exhausted, and the fruit upon it inferior. The varieties are the black, common red and white, the Dutch, or large, or grape, white and red, champaign, &c. The Dutch are the best. They do not produce so much wood as the common; but they give proportionally more and larger fruit, particularly the red.

GOOSEBERRIES

Are liable to be spoiled by mildew; but we have reason to believe, from the experiments we have made, that the disease may be prevented by a strong pickle being poured about the plants in winter, when vegetation is dormant. The varieties of this fruit are very numerous. The thin skinned of medium size are the best.

For directions for propagating the gooseberry, currant and grape, by layers and cuttings, see pages 29 and 30 of vol. III. of Cultivator.

RASPBERRIES,

Particularly the white and red Antwerp, are deserving of culture, where this fruit does not abound in a wild state. They are propagated by succors, that is, shoots which come from the roots of old plants. The canes, or stems, of the Antwerp raspberry, bear but one season, and are succeeded annually by a new growth. We cut away the dead wood in autumn, reduce the canes to four or five in a place, cut in the laterals, and also the top to the height of about four feet, and as a precaution against the frost of winter, bend down two stools towards each other, secure them at the surface of the ground by a crotched stake, and slightly cover them with earth. The raspberry requires a new berth once in four or five years, to bear well.

STRAWBERRIES.

We treated of this fruit so fully in our August number, as to supersede the necessity of adding any thing more at this time.

TRANSPLANTING.

We will only state, briefly, that in transplanting, care should be taken to give the roots their natural direction—to surround them above, below, and at the sides, with rich surface mould—and to bring this mould every where in close contact with them. As to the SEASON of planting, we should prefer early autumn, as soon as the functions of the leaves are destroyed by frost, and while there is yet a sufficient flow of elaborated sap, to produce new fibrous roots—or late in the spring, before the leaf buds have burst, and when there is a brisk circulation of ascending sap. "If trees have been planted in autumn," says Reynolds, in his Guide to the Orchard and Kitchen Garden, "they will, by the following April, have made fresh roots, and their buds will begin to push." If transplanted in autumn, it is well to throw around the plant two or three forks' full of mulch or coarse dung, to protect the roots from severe cold; and the like precaution will prevent excess of evaporation in summer.

Having thus disposed of the fruit department, we shall, in our next, treat of the culinary department of the garden.

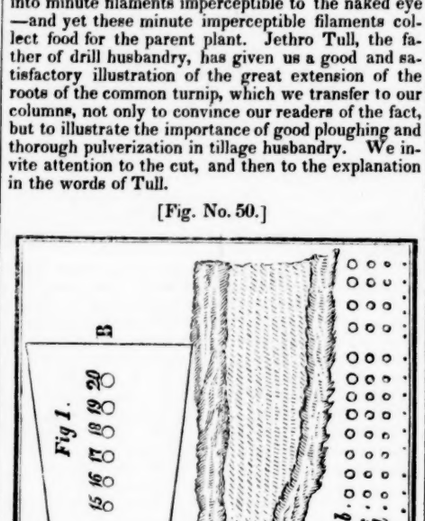
Office and Extent of the Roots of Plants.

Roots perform a double office to plants: they serve as braces to keep them in an upright position; and they are purveyors to supply them with food suitable to their growth and maturity. To enable them to perform these offices well, three requisites in the soil are essential. *First.* It is important that the soil be mellow, that the roots may penetrate in it freely, not only to strengthen their bracing properties, but to extend their range for food, this being absorbed or taken up by the spongeoles, or extreme points—and the greater their range the more abundant the food which they supply. *Secondly.* It is important that this food be in the soil, in a soluble state, that is, in a condition to be dissolved by, and incorporated with, the fluids in the soil. This food consists of vegetable and animal matters,—or of whatever has been such. *Thirdly.* It is important that a quantity of moisture be always present in the soil, to dissolve the food of plants, and to serve as the medium for conveying it first to the spongeoles, and from thence into and through the plant. Air, heat and moisture, are all essential agents in preparing the food of plants, in the soil, and in giving vigor to vegetable growth.

It should be the object of the farmer and gardener to aid these natural operations in cultivated crops; and to repay the soil, by labor and skill, for the annual tribute which they draw from it. These labors consist in returning to it vegetable food—dung—equivalent to that which they annually take from it,—in rendering it mellow and permeable to the roots of the growing crop—in regulating the supply of water, for too much is as hurtful as too little—and in keeping the surface loose and porous, for the free admission of air, heat and moisture. Hence the advantage of deep tillage, perfect pulverization, of draining, manuring, and the frequent use of the cultivator among drilled or hoed crops; and these considerations also suggest one objection against using the plough in the after culture of these crops, and of earthing or hilling them to any considerable extent—as both of these modes of culture, ploughing and hilling, tend to curtail the natural range of the roots, and consequently to diminish the pasture and food of the crop.

The depth and horizontal spread of roots, is greater than is generally apprehended, and they often branch into minute filaments imperceptible to the naked eye—and yet these minute imperceptible filaments collect food for the parent plant. Jethro Tull, the father of drill husbandry, has given us a good and satisfactory illustration of the great extension of the roots of the common turnip, which we transfer to our columns, not only to convince our readers of the fact, but to illustrate the importance of good ploughing and thorough pulverization in tillage husbandry. We invite attention to the cut, and then to the explanation in the words of Tull.

[Fig. No. 50.]



"A method to find the distance to which roots extend horizontally. A piece, or plat, dug and made fine, in *whole hard ground,* (Fig. 1,) the end A two feet, the end B twelve feet, the length of the piece 20 yards; the figures in the middle of it are 20 turnips, sown early and well hoed. The manner of this hoeing must be, at first, near the plants, with a spade, and each time afterwards a foot distance, till the earth be once well dug; and, if weeds appear where it has been so dug, hoe them out shallow with the hand hoe. But dig all the piece next the out-lines deep every time, that it may be the finer for the roots to enter, when they are permitted to come thither. If the turnips be all bigger as they stand nearer to the end B, it is a proof that they all extend to the outside of the piece, and the turnip 20 will appear to draw nourishment from six feet distance from its centre. But if the turnips 16, 17, 18, 19 and 20, acquire no greater bulk than the turnip 15, it will be clear that their *roots* extend no further than those of the turnip 15 does; which is but about 4 feet. By this method, the extent of the *roots* of any plant may be discovered. There is another way to find the length of *roots,* by making a long narrow trench, at the distance you expect they will extend to, and fill it with salt; if the plant be killed by the salt it is certain that some of its roots enter it.

"What put me upon trying this method, was an observation of two lands or ridges (fig. No. 2,) drilled with turnips in rows, a foot asunder, and very even in them; the ground at both ends and one side, was hard and unploughed. The turnips not being hoed, were very poor, small and yellow, except the three outside rows, *b, c, d,* which stood next to the land (or ridge) E, which land, being ploughed and harrowed at the time the land A ought to have been hoed, gave a dark flourishing colour to these three rows; and the turnips in the row *d,* which stood farthest off from the new ploughed land E, received so much benefit from it, as to grow twice as big as any of the more distant rows. The row *c* being a foot nearer to the new ploughed land, became twice as large as those in *d;* but the row *b,* which was next to the land E, grew much larger yet. F, is a piece of hard whole ground, of about two perches in length, and about two or three feet broad, lying betwixt those two lands, which had not been ploughed that year. It was remarkable, that during the length of this interjacent hard ground, the rows *d, c, b,* were as small and yellow as any in the land. The turnips in the row *d,* about three feet from the land E, receiving a double increase, proves that they had as much nourishment from the land E as from the land A, wherein they stood, which nourishment was brought by less than half the number of *roots* of these turnips. In their own land they must have extended a yard all round, else they could not have reached the land E, wherein it is probable that these few roots went more than another yard, to give each turnip as much increase as all the roots had done in their own land. Except that it will hereafter appear, that the new nourishment taken at the extremities of the roots in the land E, might enable the plants to send out more roots in their own land, and receive something more from thence. The row *c* being twice as big as the row *d,* must be supposed to extract twice as far; and the row *b,* four times as far, in proportion as it was of a bulk quadruple to the row *d.*"

"When roots are in a tilled state," says Tull, "a great pressure is made against them by the earth, which constantly subsides, and presses their food closer and closer, even into their mouths, until itself becomes so hard and close that the weak sorts of roots can penetrate no farther into it, unless reopened by new tillage."

Tull's work was published a hundred years ago.—It has been quoted and commented upon by most of the subsequent writers upon agriculture; and the facts above stated have neither been controverted nor disputed, either by these writers, nor, so far as we have learnt, by practical farmers. They are therefore undisputed. Why is it, that cultivated crops, upon the margins of fields, and about stumps and fast stones, give more dwarfish plants, and less product, than the well-tilled portions of the field? It is not owing to the poverty of the soil; for these portions abound most in the elements of fertility, by reason of the plough, on being raised from the furrow, depositing there the finest and richest mould. Why do meadows deteriorate? Is it not because the roots of plants have not a sufficient range, in mellow earth, to supply the requisite food—and because the unbroken soil "becomes so hard and close, that the weak sort of roots can penetrate no farther upon it"?

There are some practical improvements which we would draw from the preceding facts. And—

First—in regard to the use of the plough in Indian corn, and other hoed crops. The roots of Indian corn are known, from repeated observation, to extend in the soil at least six, eight and ten feet, and if planted in squares four feet apart, each hill has virtually a pasture of four feet square to feed upon. Now if the plough is run both ways through the crop, this pasture is reduced to at least two square feet, for the roots which furnish sustenance are within reach of the plough, and must be cut by it. Hence the plough reduces the pasture of each hill, while it continues to be employed, from sixteen to four square feet, or three-fourths.

Secondly—in regard to the application of manure, whether it should be applied in hills and drills, or spread broadcast. The roots extend simultaneously with the stems, and draw sustenance for the plant through their extreme points. Hence, by the time the crop is first dressed, the roots have extended beyond the manure deposited in the hill, and consequently the plant derives but a partial benefit from this central deposite of food. If, on the other hand, the manure is spread broadcast, the roots, as they extend, are constantly reaching new supplies, and the plant is sustained in undiminished vigor.

Thirdly—in regard to fallow crops, instead of naked fallows. Where sward ground receives but one ploughing—but that should be a thorough one—the vegetable matter of the surface is turned completely under, safe from the wasting influences of the weather. This vegetable matter readily decomposes, furnishes a permeable stratum for the roots, the food which these roots seek for, and moisture to convey it to the plants which require it. As the roots of the sod decay, the upper stratum becomes permeable to heat and air, and crumbles into a fine tilth. In the case of naked fallows, a good portion of the vegetable matter is lost, by being turned to the surface at the second ploughing, and the ground consequently becomes more compact, and is not so readily penetrated by the roots of the crop, nor by heat, air and moisture, the essential agents of vegetable growth. And

Fourthly. The facts which we have detailed, afford a strong argument in favor of the alternating system of husbandry, wherever it can be introduced—of periodically breaking and pulverizing the soil, with the plough, harrow, roller and root crops, thereby rendering it more congenial to the growth of grasses and small grain.

Varieties of Grain.

Le Couteur, in his excellent publication on wheat, which we propose to notice hereafter more fully, states that his collection consisted of 150 varieties, or kinds. The varieties of wheat, like those of the apple, may be multiplied without number, by sowing different kinds contiguous to each other—the pollen of one

kind impregnating the pistil of another, and the two, thus conjoined, produce, like two animals of different breeds, a new variety, partaking, more or less, of the qualities of the two parents. This change is not so perceptible in the seed of wheat as it is in the seed of Indian corn; but it is, nevertheless, as certain, in the habits of the new plant. We have particularly noticed this tendency to amalgamate in the maize crop, where it becomes palpable to the eye in the new corn. We planted, last spring, seven kinds of maize, a couple of rows of each, in the same field, at intervals of some 20 to 30 feet, with a view of determining both their comparative earliness and productiveness.—Every variety has become impregnated with two or more other kinds, as is indicated by the colour of the grain—and though, from the colour, &c. of these strange grains, they appear to be identical with the male parent, they will, if preserved and planted, produce entire distinct varieties. Upon the mode of producing new kinds of maize artifically, see the interesting articles from A. Robinson and G. B. Smith, in our April and May numbers.

We make these remarks preliminary to the notice of a fact, stated by M. Le Couteur, of much interest to the farmer, viz. that all our old varieties of wheat have become very much mixed, if not adulterated, by the natural process of crossing. M. L. says, that in 1832, he thought his crops were tolerably pure, yet on Prof. La Gasca, curator of the royal garden at Madrid, walking through them, he selected 23 sorts, of which some have since been discovered to be three weeks later in ripening than others. "Hence," says M. L. "I repeat, it must be obvious, that corn harvested in an unequal state of ripeness, cannot be the best for making bread,—when the greater part of the grain has been reaped in the state the farmer considered was fitted for the miller, whilst the lesser part has been in a milky state, or much over ripe, or some in states between both." To this cause he ascribes the appearance of many shrivelled, lean and ill grown grains, in many samples of wheat. We paused, while penning this article, Aug. 28, to examine several kinds of wheat, which we have growing in an experimental plat; and we found M. L's remark verified, more or less, in all, but least in the Trimestrian. In the Italian, Siberian, Tea, Egyptian, Galena and Chilian, some heads were over-ripe, some were in condition for harvesting, and others were quite green. These wheats were all sown May 19, and may be put down as to their forwardness, in the following order: earliest, Italian, Tea, Siberian, Galena, Egyptian, Chillian, Trimestrian. There are some ripe heads upon all, and some green heads upon all. Of their relative productiveness, we shall speak hereafter. It should, however, be remarked, that the seeds of these wheats come from various climates and latitudes, which undoubtedly has influence upon their maturity.

The above facts suggest the propriety of using great care in the selection of seed—that the kernels appear of equal maturity—that the seed has not been grown contiguous to other varieties—and of beginning, *de novo*, as the Scotch farmers have done in various instances with wheat, oats, barley, &c. by selecting a plant, or stool, or an ear of choice grain, and of propagating it carefully, till the product will suffice for an entire crop. The intrinsic value of the product would, in a very few years, amply compensate for the trouble. It was in this way that the Houpton oat, chevalier barley, and various other highly esteemed varieties of grain, now eagerly sought for, first obtained notice.

There is one other observation of M. Le Couteur, that we found amply verified in our early practice in farming—the impropriety of applying fresh stable dung to land intended for wheat, and, indeed, in our opinion, to land intended for any small grain, "inasmuch as it tends to produce much grass or straw, and less grain, which grain is also of a dark coarse nature. *Stable dung should be applied plentifully to the preparatory crop,*" and lime or ashes to the wheat when they are procurable.

M. Le Couteur quotes Columella's account of the varieties of wheat cultivated in his time, which was about the commencement of the Christian era.—Among the varieties described by Columella, we observe one whose name and character materially correspond with a sample sent us by Mr. Ashburner, of Stockbridge, last spring, and which we have grown. We subjoin the quotation.

"The Trimestrian," says Columella, "shall be the third, which husbandmen are mighty glad to make use of; for when, by reason of great rains, or any other cause, the early sowing has been omitted, they have recourse to this for their relief. It is a kind of white wheat. Pliny says, that this is the most delicious and daintiest of any sort of wheat, exceeding white, but without much substance or strength, only proper for moist tracts of land, such as those of Italy and some parts of Gaul; that it ripens equally, and that there is no sort of corn that suffers delay less, because it is so tender that such ears of it as are ripe presently shed their grains, but in the stalk, it is in less danger than any other corn, for it holds its ear always upright, and does not contain the dews, which occasion blasting and mildew."

The Diseases of the Plum and Pear,

That is, the canker on the one, and the blight on the other, continue to arrest the attention and employ the pens of our horticulturists and pomologists. The causes that are conjectured, and the cures that are recommended, are almost as multiplied as the writers. There is no doubt in our minds, that many of the failures in these fruit trees, are owing to a bad soil, or bad subsoil—to the absence of some matter essential, or to the presence of something prejudicial, in the soil, to their health and vigor. But the diseases in question, which, so far as our memory serves, are comparatively recent, are undoubtedly caused by insects. "Like causes produce like effects," is a maxim of unquestionable truth. The elements remain as they always were. If these diseases were owing to the soil, the sun or the atmosphere, why were they not known to our grandfathers? But that new insects are continually coming among us, is wofully evidenced by the depredations of the Hessian fly, the bee moth, and the grain worm, which depredate upon our wheat and our honey. And why not the like new and unwelcome visitors upon our fruit trees? Another reason for imputing these diseases to insects is, that they seem to come periodically—to intermit for years—and to continue for years. We saw the pear blight in 1801, and in 1825; and the canker in the plum at different periods. For the last few years we have been comparatively exempt from both. Insects do appear at intervals of years. The locust is said to be fourteen or seventeen years in its various transmutations. We yet know hardly half of the insect creation. All matter seems animated with life, which, in its minutest form, is capable of inflicting incalculable injury upon man. See, for instance, the aphides, which prey upon almost every plant; the fly and grain worm which destroys our wheat—the various tribes which live upon our farm-stock, and others that are parasites upon man. And are fruit trees alone, of all animated nature, to be exempt from these minute enemies, which cause disease and death?

Diseases of trees, we have said, are often to be ascribed to the absence, in the soil, of something essential to the plant, or of something prejudicial to its growth. Where this is the case, the evil, we think, may in most cases be remedied, by trenching the ground, preparatory to planting, and by the admixture of clay, or lime, or such other elementary matter as the soil may appear to be deficient in. Last autumn, we followed Mr. Reed's suggestion, and placed around many of our pear trees furnace cinders; and around others tan from the morocco factory.—The earth was taken away from around the base of the trees, two or three shovels full of the material thrown in, and the earth thrown back upon it. No blight has appeared upon them, and most of the trees have started with new vigor. Whether the cinders and the tan benefit, by neutralizing something obnoxious in the soil, or by affording a requisite food, we are unable to say; but it seems certain that they promote health and growth.

Varieties of Early Indian Corn.

The *Maine Farmer*, of Aug. 21, says, "the Dutton corn grows luxuriantly, but is much later than many of the old varieties."

The *Farmer and Gardner*, of the same date, printed at Baltimore, states two cases of the Dutton corn being gathered, in a ripe state, in less than 90 days from the time of its being planted, viz. Mr. Giles planted on the 17th May, and gathered perfectly ripe samples on the 15th August; and Mr. Harrison planted, on the 16th May, and gathered on the 14th August.

The *Franklin Farmer*, printed at Frankfort, Ky. of Aug. 18, says, "Our Dutton corn, planted April 30, has been gathered more than a week. It is perfectly ripe, hard and well cured. Though a dwarf species, it is a generous bearer, and we are satisfied, from the experiment of this season, that an acre of it will produce as good an average crop as our larger eared corn."

Some of our Dutton corn, planted on the 19th May, had perfectly ripe ears on the 15th Aug. and this part of our crop was harvested, that is, cut up, on the 28th Aug. though it might safely have been done on the 21st; and most of the Dutton corn in our neighborhood, was harvested either in August or the first week in September.

We have recorded these facts, to explain their seeming contradictions, and to make some suggestions, which we think of importance to the farmer, in regard to seed.

We have before observed, that there is a spurious, as well as a genuine, Dutton corn, the former of stouter growth, and later in ripening, than the latter. We would remark, that this difference may result from the seed planted—seed of the same variety, grown at the south, giving a larger growth of stalk, and maturing later than seed grown at the north.—This is evidenced by the fact, that southern seed always gives a comparatively large and late growth at the north; while northern seed gives a dwarfish growth and early maturity at the south—and that they both become acclimated in a few years, and take the habits of their new location. These considerations suggest, that so far as early maturity is sought for, it is advisable, when a change of seed is desired, to obtain it from a more northern latitude, or elevated district.

But we adopt the opinion of Joseph Cooper, so far at least as relates to maize—which was, that a change of seed is *not necessary*, when due regard is paid to *selecting* the seed. We have cultivated the Dutton variety of corn eighteen years—we have always selected the earliest and fairest ears, assisting in person, for seed, which we immediately braided, and hung in an airy loft. It has ripened as early this, as it did the first year we received the seed from the far north; while we are satisfied it has increased in productiveness—that it has larger ears, and more of them, and taller stalks, than it had when we first began its culture. The seed is left to mature on the stalk, till the crop is gathered from the field—the earliest ripened, being then easily determined by the appearance of the shuck, or husk, and the rich colour of the corn. Hence the importance of every farmer taking care to secure, in person, his best seed.

There is one other fact that should not be lost sight of—the influence of soil and location upon vegetable growth. A moist, rich soil, will give the largest growth, both of foliage and fruit, and a light and dry one the earliest maturity, and the richest or most concentrated product. Prof. Ives states, that plants from the seed of the morus multicaulis, have the foliage of the parent in a rich humid soil, while they resemble those of the M. alba, on a thin light soil; and it is believed that a pound of the leaves of the latter are intrinsically more valuable to the silk-worm than a pound of the former. It is not the size that indicates superiority in the animal or vegetable. A very large apple is seldom a very good one. The cider from a hilly, dry, calcareous soil, is always superior to that from a low and rich one. A very large beet contains much less sugar than the same weight of small beets. Indian corn, grown upon a light dry soil, comes to earlier maturity, but is inferior in its growth, and in the size of its ears, than when it is grown upon a highly manured loam. Indeed the difference is so great, on our own grounds, this season, that the growth and product in two locations, would hardly be taken for the same variety.

We have another suggestion to make, in regard to the influence of steeps. It will be remembered, that in our last volume, we referred to a communication of Senator Johnson, inserted in the first volume of the transactions of the old agricultural society, showing that the crop from seed wheat, steeped in a solution of salt-petre, ripened two weeks earlier, and gave 25 per cent more product, than the crop from seed which was not thus steeped. We began to plant our main crop of corn on the 12th May, and finished on the 16th. All the seed was steeped 12 hours in a solution of nitre, in quantities sufficient for one day's planting. A few quarts of seed, which remained, was set in the cellar, where it remained, partially covered with pickle, till the 19th, when it was planted in a vacant patch of thin soil, in which we also planted, the same day, six other varieties, all reputed to be remarkably early, and the seed of all which had been soaked in salt-petre water. The last planted Dutton corn, was decidedly the earliest of the seven sorts in coming to maturity, and was at least two weeks earlier than the main crop, planted from three to six days earlier. Its maturity may have been in some measure accelerated by the porosity of the soil, compared with that of the main field, which was highly manured with unfermented dung, and to the consequent influence of the dry weather; yet we think it not improbable that it was principally owing to the seed having remained saturated, for 96 hours, in the nitrous solution.

Having referred to our specimen plat, we will add, that it consists of the following varieties of corn:

1. Dutton; 2 and 3. Lake Superior and Squaw from Lake Michigan; 4. Early white, not recollected where from; 5. Early Canada, from Poughkeepsie; 6. Red Blaze, from Elmira; 7. Early yellow, from Vermont. These varieties were all planted the same day, two rows of each, with intervals between the different kinds of 20 or 30 feet. On examining them to day, Aug. 28, we find No. 1 mostly ripe, the husks dry and separating from the grain; No. 2, Lake Superior, an 8 rowed yellow, growing 4½ feet high, but very prolific in succors and ears, next to the Dutton in maturity. The early white is an 8 rowed corn, 5½ feet high, and is third in ripeness. The Vermont is a yellow 8 rowed corn, grows 6 feet high, and is next in ripeness to the early white. The Squaw, No. 3, is an 8 rowed coloured grain, grows 6 feet high, and is fifth in its earliness. The Red Blaze comes

next, and the early Canada is the latest. Both are eight rowed, and, like the Dutton, they grow seven and eight feet high. As to *number* of ears on a stock, they are about alike, except the Lake Superior, which is far the most prolific in its succors and ears, though they are very small. As to the *size* of ears, the Dutton has a manifest superiority; as to length of ears, the early Canada and the Red Blaze, 8 rowed, are equal, if not a little superior to the Dutton. Several gentlemen, who have visited the plat, concur in the correctness of this statement. We intend to exhibit samples of each of these varieties, at the fair of the American Institute. We omit the notice of later ripening varieties.

The Crops.

In addition to the notices of the crops, which will be found under correspondence, we give the following brief abstract from the newspapers:

In Maine, the crops are generally good. The grain-worm has, however, done considerable damage to wheat.

In New-Hampshire and Vermont, the early harvest was abundant, and the Indian corn has been much better than ordinary.

In Massachusetts, the crops have been better than ordinary, though the potato and other late autumn crops, have suffered in the southern parts of the state, as they have through all the middle states, from the drought in July.

In Connecticut, the injury from the dry weather in July, has greatly diminished the autumn crops, though the early ones are believed to have been good.

In New-York, the summer harvest was generally abundant, and well got in. South of Albany the dry weather has seriously diminished the product of the latter harvest, particularly of the potato crop. North of Saratoga, no want of rain has been experienced, and the autumn crops are fine. The same remark, we believe, will apply to Oneida, Onondaga, and most of the counties lying in the more elevated portions of our state. In the western counties, the drought of July did considerable damage, and still more in the southern counties.

In New-Jersey, it will be seen by the letters of our correspondents, in this and our last numbers, the autumn crop has, in a measure, been a failure.

In Pennsylvania, Maryland and Virginia, the wheat crop was good, the rye inferior, oats a small yield, corn very deficient, and potatoes a virtual failure.—The Commercial List, of Philadelphia, states as follows, in regard to East Pennsylvania and New-Jersey: Wheat, decidedly good. Rye, half an average crop. Oats, two-thirds of an average. Corn, one-fifteenth of an ordinary crop. Buckwheat, little expected. Potatoes, early kinds very light; late, an entire failure. Hay, first crop good. Pasture, none in August.

In Delaware, the corn crop promises to be an average one.

In Maryland and Virginia, the wheat has been good; but the corn has been seriously injured, and in many cases utterly destroyed, by the dry weather.

In the states still more south and west, the wheat crop has been great, and the corn generally promised at least a medium crop.

We shall go more into detail in these matters in our annual report. In the mean time, from all the information in our possession, we venture it as our opinion, that wheat is much more abundant, and that flour will consequently be lower in market, this winter, than it was last; that Indian corn, and probably rye and oats, will sustain their present prices, and may advance; and that potatoes will command, south of our latitude, an unusually high price. The failure of the potato crop, and, we are sorry to add, the unusual depredations of the fly upon the ruta baga, will undoubtedly have an influence upon the price of the coarser grains and hay, which latter, however, may be considered abundant throughout the union.

Will the politician, the manufacturer, the merchant and the mechanic, pause a moment, and reflect upon the controlling influence which the abundance or scantiness of the harvest has upon the prosperity of our common country, and upon their several pursuits? If the harvest is abundant, the whole land is prosperous and happy. If the harvest fails, every class feels the electric shock, business becomes stagnant, embarrassments multiply—and the whole land mourns. How important is it then, that all should feel and exert a direct influence in encouraging and qualifying the husbandman to increase the products of the soil—by legislative patronage, and by a system of enlightened education, calculated at once to make better farmers and better citizens.

Pruning of Trees.

If there is any branch of rural economy, which a lover and cultivator of good fruit should personally understand better than another, it is that of pruning and taking care of his fruit trees. As but very few understand *how* and *when* the operation of pruning is best performed, it is extremely difficult to *hire* it done well unless the owner himself is competent to direct in the matter.

In all sorts of trees reared for standards, the first object is to obtain a straight bole or stem, at least to a given height, sufficiently stout and tapering to sustain the top. Having acquired the requisite height, the next object, in the management of fruit trees, is to obtain a proper and productive top. To effect the first point, the common practice is, to begin to prune at the *bottom*, and to divest the lower part of the plant of its limbs and leaves. The consequence is, that the plant becomes spindling—the growth being perfectly equal up to the first branches—top-heavy, and ultimately ill-shaped; or, being deprived of a great portion of its leaves—its lungs or elaborating organs,—its growth is materially checked. Those equally err who do not prune at all; as the branches soon interfere with each other, the top becomes too thick to produce or mature well its fruit, and the consequence is a *growing*, not a bearing tree.

In the first stages of growth, the object being to get height and strength, few or no branches should be cut close to the bole, and the long ones, and those that compete with the leading shoot, may be shortened one-half their length; but not a healthy leaf should be unnecessarily removed from any part of the plant. Thus the stem will grow tall and strong, with a gradual taper from the lower branch to the terminal point at top. As to the time of pruning, particularly the apple, we persist in recommending—the long days in June,—when the plant is full of elaborated sap, and yet the flow of sap so moderate, as to be taken up by the remaining branches, without generating succors.

Fumigation to Destroy the Grain-Worm, &c.

We are told that fumigation has been resorted to, to prevent the depredations of the grain-worm; and that although attended with some labor and expense, it has been found to be both successful and economical.

It is stated in an Amsterdam paper, that a farmer in Herkimer, has saved from the worm, an extensive wheat crop, by fumigating with brimstone for a few days, when the wheat-fly most abounded, while all around him was swept as with the besom of destruction. He employed 100 lbs. of brimstone to a field of 100 bushels sowing. The brimstone was melted, and strips of old woollen cloth dipped in it, which were fixed on sticks in different parts of the field, and particularly on the windward side, at evening. The smoke and gas of the sulphur, which is offensive or destructive to the insect, thus every where penetrated the standing grain, and preserved the crop.

The Yankee Farmer advises, that burning or smoking with pine knots, has been found efficacious. The mode of operating is, to brush the tops of the grain with a long pole, carried across the field in a horizontal position, which causes the fly to rise,—a strip of board, raised somewhat above the pole, is perforated with holes, into which are placed splinters of fat pine, which are lighted—and the flame scorches the wings of the flies as they rise.

Of these expedients, the first appears to claim the preference; and we think it would prove efficacious in protecting young fruit from the curculio, were brimstone employed in this way, occasionally for a few days, to fumigate the branches of the trees; the young fruits would become so impregnated with the fumes of the sulphur, as to render them obnoxious to the insect.

A writer in the Farmers' Magazine, says he practises fumigation to preserve his young turnips from the fly. He collects the weeds on the farm, lays them in heaps round the field, and on the appearance of the fly, the heaps to windward are set on fire, brimstone thrown upon them, and the offensive smoke is wafted over the crop. This is repeated till the turnips attain their second leaves, and is always successful.

English Agricultural Society.

The subscription to this society, now organizing in Britain, embraces the names of nearly 100 members of parliament, and a great many of the nobility and gentry, of all political parties. Ninety individuals have subscribed each £50, ($222,) to constitute them life members or life governors; and 115 others have subscribed £5 ($22.20,) annually to constitute them governors—ordinary members pay £1=to $4.44 per annum. This is but the commencement. Thus will a fund be secured in the outset, from other than ordinary members, of more than $22,500. We should like to see this spirited example imitated by the capitalists and statesmen of the United States. It would form a new and auspicious era in our history, and evince at once a high feeling of patriotism, and a discriminating judgment in the display of it.

Beware of Loco-Foco Matches.

A boy was bringing into our room some parcels of these matches, when a bunch, wrapped in a paper, slipped from his hand, and fell on the carpet; the friction occasioned by the fall instantly ignited the bundle. We doubt not but many recent fires have been caused by the accidental ignition of these phosphorated matches. Every house-keeper should see that these matches are securely kept in metal or earthen, and apart from all combustible materials. Another modern improvement—the portable furnace—we doubt not, has led to immense losses by fire.

On the Causes and Prevention of Rust or Mildew.

The Quarterly Journal of Agriculture, to which we are indebted for much valuable matter to fill our pages, has a lengthy article on smut, canker, and rust or mildew. Having published in our two last numbers, several articles on the causes and means of preventing smut, we shall now give so much of the article from the Quarterly, as is descriptive of the rust or mildew, the ascertained cause of the evil, with some suggestions for its prevention, omitting the speculative opinions which have prevailed on the subject, and their refutation by modern writers and experience.

DESCRIPTION OF RUST OR MILDEW.

"Rust first makes its appearance on the upper leaf, and then on the lower leaves and the stem, in the form of small white spots, scattered irregularly like spots made by rain on new cloth. These spots gradually increase in size and number, and assume a reddish tinge, and at length form a sort of dust-looking powder, of an ochre or orange yellow, little cohesive, and without smell or taste, and therefore very different from canker or smut. It stains the fingers yellow, as well as the clothes of those who walk among the affected corn.

"The dust-like substances of the rust originates beneath the outer bark or epidermis of the plant, which it raises up, renders thin, and at length cracks and bursts through. When examined by the microscope, it presents a congeries of egg-oblong bodies, some of which have projections almost like tadpoles or *powcheads*, though they are not animated.

"Wheat is attacked with the red rust at different periods of vegetation, but more particularly when in the ear. When the rust seizes young plants, they are said to suffer less than when they are more advanced, often recovering vigor before blooming; whereas at a later period they sustain irreparable damage, and crops which promise well are often in a short time rendered comparatively worthless. In this case the texture of the leaves is disunited, and presents only longitudinal fibres of a brown colour, while the joints and the tubes of the straw between are blackened, as if they had been scorched by fire, the growth ceases, a portion of the ear becomes yellow, another portion remains green, and the grain shrivels up in the husk without attaining maturity.

"The evil, however, is rarely carried so far as this, and the yellow spots of rust become chocolate-brown or black, without disorganizing the portions of the plants where they occur; and the Abbe Tessier says he has seen, after heavy rains, the clothes of the reapers stained with this black substance of the rust as if they had been dipt in ink. But though the plants are not disorganized, the flow of the sap is interrupted, the ripening of the grain is prematurely hastened, and it is hence light, containing a small proportion of farina, while the straw is bad. Sometimes the rust only leaves a yellow powder on the husks and upper end of the grains, taken by Fontana and others to be a different species.

"Sometimes rust prevails so extensively, that few fields escape; but for the most part it is observed in fields sheltered from the north winds by walls, hedges or woods, or where vegetation is very luxuriant, on account of fresh soil or abundant manuring. Sometimes one part of the field escaps while the other is attacked; sometimes the chief plants, and at other times the side shoots tillering from them are affected; and sometimes rusty and sound plants grow from the same root."

OF THE INFLUENCE OF THE BARBERRY BUSH.

Although it is conceded, that the farmers of England, and on the continent, generally ascribe the rust, in a measure, to the infection which spreads from the barberry bush, and that this notion is sometimes strengthened from the rust appearing in patches and strips among the grain, as if it had been carried thither by the wind from the barberry bushes—and although this opinion was sustained by Sir Joseph Banks,—the writer nevertheless considers the theory as fallacious, and quotes an anonymous authority in saying, that the rust which is found on different trees and plants is altogether of distinct and separate species.

"*Dutrochet's discovery of the mode of growth in funguses.*—In a damp cellar where wine was kept, M. Dutrochet, one of the most original observers of the day, remarked, about two or three years ago, a white looking net-work of fibres, which previous botanists had described as a species of crow-silk, (*Byssus.*) Being struck with its peculiar manner of growth, he watched it with careful attention, and got M. Tupin, probably the best botanical draughtsman in Europe, to take drawings from it in every stage of its growth. The general result was, that the supposed crow-silk was not, as had been supposed, of the genus *Byssus* at all, but the genuine stems, hitherto known as such, of a mushroom, (*agaricus crispus*, Tupin,) the mushroom itself being the fruit only, and not as hitherto believed, the whole plant. According to this view, then, it would be as correct to consider a bunch of grapes, with their fruit-stalk, a complete plant, as the fruits termed mushrooms, puff-balls, or puddock-stools, all these being but the fruits of plants generally growing under ground, in the form of small white or grey fibres of net-work, and termed improperly by gardeners, *spawn*, indicating that it is the seed of mushrooms, whereas it is the genuine plant.

"M. M. Dutrochet and Tupin, further discovered, that the seeds, or, as they are termed by botanists, *sporules*, consist-

ing of minute globular bodies, are contained in the cells of fungus fruit in prodigious numbers, and they succeeded in observing these germinate and produce young plants like their parent. There therefore cannot remain a doubt, that funguses are produced from seeds in the same way as all other vegetables, though these seeds or sporules are exceedingly smaller than those of green plants—being as subtle, Mr. Fries remarks, sometimes as smoke.

"Contrary, then, to what takes place in regard to the eggs of insects, which are too heavy to be carried about by winds, and if they were lighter, are generally, when laid, glued to the substances destined for the food of the young, when hatched, the minute, light, subtle seeds of funguses and mosses are floated about in the air with the gentlest breeze, and in this way diffused over immense tracts of country, in numbers altogether countless. The discovery of M. Dutrochet is, therefore, of the greatest interest in making us acquainted with the economy of Providence in the propagation of fungi, hitherto altogether mysterious.

"What we term smut, canker and rust, are, according to this discovery of M. Dutrochet, only the fruit of particular funguses, the plants of which they are the fruits being hitherto undescribed and unknown, but which must be sought for in the form of delicate fibres, probably transparent, and probably difficult to see in the textures of the corn affected with those destructive parasites.

"It forms no objection to this view, that the fibres of these funguses have not been seen except partially by Bauer and Ad. Brongniart, in their microscopal researches, for M. Dutrochet further found, that when the fruit of the plant observed by him (*agaricus crispus*,) sent up its foot-stalks, (*stipes*) it became partially detached from the main plant, and independent of it for its future nourishment, the fibres of the main plant indeed becoming exhausted of substance, and disappearing as in what were previously supposed to be the roots at the base of the fruit-stalk in the edible mushroom, which supposed roots are the fibres of the main plant, partly exhausted of their substance by the nourishment of the fruit."

The editor of the Quarterly here details some ingenious experiments of M. Fee, to ascertain the manner in which plants become affected by fungi, or the mode in which the sporules are propagated. M. Fee infers from the result of these experiments, that the seeds or sporules of the fungi are sucked up with the moisture of the soil, by the tips or spongioles of the root fibres.

ASCERTAINED CAUSE OF RUST OR MILDEW.

"The rust, and various sorts of what are termed mildew, are all caused by small fungi, such as the tuft-brand, (*Peccunia graminis*, Per-oon; or *uredo fumenti*, Sowerby,) and the linedebrand, (*uredo linearis*, Persoon; *u. largissema*, Sowerby,) which do not differ so much in the injuries which they produce as in their mode of growth and appearance, as has been already described.

"The history of the red rust need not detain us, as it has been long well known from the very good account given of it by Sir Joseph Banks, with most admirable drawings, by M. Bauer. The opinion, however, which Sir Joseph seems to adopt, is, not that the seeds of the rust fungus get into the corn plants by the tips of the roots, but by the pores on the leaves and stems, being carried there by the winds, and caused to adhere by the moisture of dew or rain. When once entered into the pores, he says—'they germinate, and push their minute roots, no doubt (though these have not yet been traced,) into the cellular texture beyond the bark, where they draw their nourishment by intercepting the sap that was intended by nature for the nutriment of the grain. The corn, of course, becomes shrivelled, in proportion as the fungi are more or less numerous on the plant; and as the kernel only is abstracted from the grain, while the cortical part remains undiminished, the proportion of bran in blighted corn is always reduced to the same degree as the corn is made light. Some of the last year will not yield a stone of flour for a sack of wheat.'"—*On blight in corn.*

PREVENTION OF RUST.

On this branch of the subject, we find little to copy, that, in our opinion, is worth the pains. The writer adopts the opinion, that the seeds or sporules of the fungi, smut, canker and mildew, are disseminated in myriads over our fields—that these seeds are carried into the soil by the rain, and that they enter the plant by the tips of the roots. The prevention recommended is paring and burning, or copiously liming; the first of which he thinks will destroy wholly, and the other partially, the vital power of the fungi.

We dissent from the opinion of Fee, adopted by the Quarterly, that the seeds of the fungi enter the plant by the root, and are disposed to believe with Sir Joseph Banks, that the seeds of the rust-fungus get into the plant by the pores of the leaves and stem. And we will offer some reasons for this belief. 1. The prevalence of rust depends much upon the temperature and humidity of the season when it prevails. If the season is moist and hot, and the atmosphere calm, this disease most abounds. On the contrary, if it is cool and dry, and northern winds prevail, we see very little of it. 2. The prevalence of rust depends much on exposure and luxuriance of growth. If the field is much sheltered from drying winds, the air in a measure stagnant, or the growth of straw luxuriant, as on the site of dung heaps, the rust-fungus is pretty certain to appear; but it seldom shows itself in open exposures, where the growth of the straw is moderate, or has not been stimulated by recent or too abundant manures, except the season is hot and humid. Upon M. Fee's theory, all seasons and all soils would produce it alike, provided the soils were once impregnated with the seeds. Its appearance only in certain seasons and in certain locations, can readily be explained on Sir Joseph Banks' theory. In the seasons and locations in which rust is most prevalent, the atmosphere is comparatively light and stagnant, and the epidermis of the grain soft, spongy and moist. Now assuming what M. Fee asserts, and we have no reason to doubt his correctness, that the seeds of the rust-fungus are as subtle as smoke, they might readily be wafted by this light atmosphere to the leaves and stems of the grain, which would be in an excellent condition, under such circumstances, to receive and nurture them. But when the atmosphere is dry, and the air in brisk circulation, its specific gravity is too heavy for these seeds to float in it, and the leaves and stems of the grain are less fitted for its reception. When the atmosphere is light, smoke lingers upon the earth's surface; when it is dry and heavy, smoke immediately rises to the upper regions.

If our views are correct, liming, or even paring and burning, would effect little towards the prevention of rust and mildew. The best preventives, in our opinion, are, to apply the manure intended for wheat, to a previous hoed crop, that the heat of fermentation, which causes a strong and protracted growth of straw, may have subsided; and to sow upon dry grounds, or if flat and retentive, to lay the land in ridges, that all surplus water may readily drain off. These precautions, added to clean and thorough tillage, we think, will be as efficacious as paring and burning. Liming wheat lands, we have no doubt, is beneficial in many respects; but that it will prevent rust, we have no facts before us that will justify us in asserting.

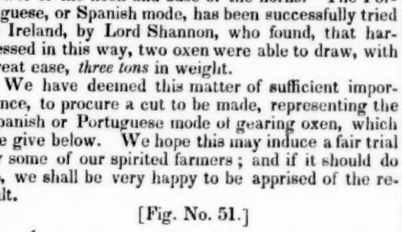
Ox Gearing.

The communications which we have heretofore published, from Mr. Allison and Mr. Woodruff, on the subject of ox gearing, have given an interest to the subject, which we trust may lead to some improvement in the matter. We feel assured, that the common mode of gearing oxen is a bad one, and that it may be modified with advantage to the animal and his master.

The Spanish mode of gearing seems to be the same as that practised in Portugal, and strongly recommended by Lord Somerville. The principle of draught depends, his lordship justly observes, on the joint power of the neck and base of the horns. The Portuguese, or Spanish mode, has been successfully tried in Ireland, by Lord Shannon, who found, that harnessed in this way, two oxen were able to draw, with great ease, *three tons* in weight.

We have deemed this matter of sufficient importance, to procure a cut to be made, representing the Spanish or Portuguese mode of gearing oxen, which we give below. We hope this may induce a fair trial by some of our spirited farmers; and if it should do so, we shall be very happy to be apprised of the result.

[Fig. No. 51.]



Successful Mode of Preserving Milk at Sea.

In November, 1836, a part of the conductor's family being about to sail for Europe, a dozen bottles of milk were prepared for their use, in the following way: The milk was drawn from the cows immediately into the bottles, the bottles well corked, and the corks secured with wire. The bottles were then laid into a kettle, upon some straw, the kettle filled with cold water, and the water heated to the boiling point. The milk was used on the passage, perfectly sweet, except one bottle, which lay in a chest unnoticed till it reached Ireland, and it was then found to be as sweet as when it was bottled at Albany.

A Convention of Farmers,

To wit: two from Connecticut, one from Georgia, one from the District of Columbia, two from New-Jersey, fourteen from the state of New-York, three from Massachusetts, two from Vermont, two from Ohio, one from Virginia, two from Pennsylvania, one from Upper Canada, one from Maryland, and one from Michigan, together with the conductor of the Cultivator, in all thirty-five individuals, met in Albany in May last, for mutual instruction in the business of husbandry,—to communicate and obtain useful information in their business. The meeting was one of great interest, and many facts were detailed, calculated to benefit each individual member, and to advance the public interest. It affords us pleasure to add, that like meetings have been, and will continue to be held monthly, and that some twenty thousand readers are receiving benefit from these monthly deliberations. Now, reader, all this is matter of fact, save that the individuals did not appear in *person*, but sent to the conductor their information and inquiries by letters, which were faithfully recorded in our June number. And is the information less valuable, by being written with care, and printed, so that it may be preserved and referred to, than it would have been if delivered by word of mouth, and liable to be forgotten and lost? We think not. We invite farmers then to profit by this concentrated knowledge of their brother laborers, by becoming patrons to the Cultivator, which promulgates it, almost without money and without price.

What is Book Farming?

The editor of the Quarterly Journal answers the question as follows:

"Book farming, we know, is not in favor with farmers, otherwise we should find admittance into *every* farmer's library, and every farmer [in Scotland] has a library. But although we know, and therefore admit, that no man can be made a farmer by book, we cannot admit that the best farmer cannot, may not, at a time, find useful hints in a book.—The best farmer cannot know every article of practice which is followed in every part of the country; and as most practices are discovered by what is called chance or accident, it is clear that the discovery cannot generally be made known until it is disseminated abroad. A farmer who travels, appreciates the information which he receives in conversation with farmers, and by observation of field labor. Such a farmer possesses advantages over him who always remains at home, that is, within the circle of his markets. Now the object of an agricultural book, and particularly of an agricultural periodical work, is, at stated times, to carry hints, suggestions or discoveries, important or unimportant, to the home of the farmer, that he who loves to stay at home may possess the advantages of him who at times travels abroad, and that he who travels abroad may compare what he has seen with what he reads, and decide which practice is best suited to his particular purpose; or perhaps when comparing the hints of others, he may himself discover a practice superior to them all. In this manner a good agricultural work is the means of disseminating through the country practices which would be confined to the district which gave them birth. Its principal aim should be to be a *good* work, that is, replete with suggestions of good sense, and with confirmations of experience. The collection and presentation of these desiderata, is attended with much trouble and expense, and unless the labor is appreciated and encouraged, it is impossible to use the means to collect the most valuable kind of information for presentation."

The Fair of the American Institute,

It will be remembered, commences at Niblo's garden, New-York, on the 15th inst. and will probably continue ten days or more. These fairs have done much to call forth and to publish, the inventive genius and skill of our countrymen, and to excite industry and emulation in the productive classes of the community. They deserve the countenance and support of every well wisher to the prosperity and independence of our country, and we trust they will command them.

Draining averts the effects of Drought.

That is, we mean to say, that grounds naturally wet, suffer more severely from drought *before*, than they do *after*, being thoroughly drained. The presence of standing water on a soil, even for a short time, tends to render it close and compact; and when the water evaporates or subsides, it becomes baked and very hard. On the other hand, if water merely passes through a soil, as it does where the subsoil is porous, or where there are sufficient under-drains to receive and convey it off, the earth remains light and pervious to the beneficent influences of heat, air and dew, from above, and to the capillary attraction of moisture from below,—a highly beneficial process to the crop, and the advantages of which depend much upon the porous condition of the surface stratum; and this in turn, as we have observed, is most porous where there is a ready outlet for all excess of water. In a field, last year, we lost nearly an acre of potatoes, on the slopes of a ravine, the soil being wet in the spring upon, and later under the surface. The water was partly from the surface, and had settled down upon an impervious stratum, and partly from spouts, which apparently rose from below the impervious stratum; it found egress on the slope of the ravine, or at its base, and saturated the whole soil to extreme wetness in spring. But when the season became dry, and the sources of supply in a measure exhausted, the surface soil became almost as hard as a brick-bat. In the fall, we constructed under-drains, with tile, so as to catch and convey off the water, before it came within two feet of the surface, and planted the ground with corn the present season. The crop upon these strips looks as well as in other parts of the field, has received no injury from drought, as the soil, instead of being hard baked, as it was last year, is comparatively loose and porous.

Under-draining becomes more and more requisite upon flat or impervious soils, as they are subjected to culture. New lands abound greatly in vegetable and ligneous matter, which impart a comparative lightness and porosity even to stiff clays. But as these lands are subjected to tillage, and the exhausting influence of crops, the vegetable matter diminishes, and the soil itself becomes more compact and adhesive, according to the good or bad husbandry which is adopted upon it. We know of a district in

Vermont, which, within our recollection, had a fine kind wheat soil, abounding in vegetable matter.—The vegetable matter has become exhausted by bad management, and the soil thin and compact; and as it rests upon hardpan, impervious to the surface water, it is no longer fit for tillage crops, and cannot be rendered fit for them, till it is relieved from its excess of water by under-drains, and kept under a more enlightened—a more scientific system of management. Such, we are pretty confident, will be the condition of many districts of light land in the yet fertile west, if timely resort is not had to under-draining, to manuring, and to alternating crops.

Effects of Alkali in preserving Wood.

The antiseptic properties of alkali, in preserving wood from rapid decay, must have been witnessed by most persons, in the boards and timbers about asheries, lime-kilns and the depositaries of lime. Its effect seems to be to neutralize the mucilagenous matter of the wood, whether in a dry or moist state, the tendency of which, heat and moisture being present, is to bring on fermentation, and consequent decomposition; while at the same time it seems to exclude, in a great measure, the free access of water into the pores of the wood. Our attention was first directed to this subject, by seeing, near Bordentown, N. J. a large vat filled with lime and water, or lime water, in which were immersed a great number of timbers, intended for the cross-timbers of a rail-road; and more recently by a communication in the Farmers' Cabinet, on the preservation of the roofs of buildings, by soaking the shingles in lime water. It is not, it seems, the insoluble parts of the lime, which is efficacious—for these rather obstruct the escape of prejudicial moisture from the wood—but it is the caustic alkaline solution of the lime—the liquid resulting from pouring water upon fresh burnt or recently slaked lime, that constitutes the antiseptic, and that powerfully arrests the decay of woody matter.

The writer of an article in the Cabinet, whose name we would creditably record, had he not been deterred, we fear by a false modesty, from giving it to the public, directs, that for saturating shingles, with alkali, an elevated box should be made, to mix the lime and water, so that the lime-water, when suitably prepared and clear, can be drawn off into a lower box, in which the shingles are placed upon their butt ends, so that that portion of them, which, when laid, is to be exposed to the weather, shall be completely saturated with the lime-water, which will require some hours. We would suggest that the entire shingles be immersed in the liquid, as the part not exposed to the weather, is also liable to decay.

White-washing with lime, the wash being impregnated with salt, has long been recommended by Mr. Coke and others, as a preservative to the wooden coverings of buildings, fences, &c. And it has this further to recommend it, that it promotes cleanliness and health, and is, withal, in the absence of paint, ornamental.

It is a matter of some importance, that the lime used in these processes, and it may be used to advantage for many other rural purposes, should be in a caustic state, that is, fresh burnt and well burnt; and that it be used as soon as practicable after the preparatory process is completed, as its effects, in destroying vermin, removing infection, or preserving wood from decay, depend upon its alkaline properties, which are rapidly diminished by exposure after it comes from the kiln.

Experiments in Manuring Turnips.

S. W. Smith has given to the public, in the Farmers' Cabinet, the result of an experiment with various manures upon his turnip crop, which are worth recording and remembering. He divided an acre of land into four equal parts, and gave to No. 1 a dressing of common stable dung; to No. 2, an extra quantity of compost manure; to No. 3, ten bushels of lime and two and a half of wood ashes; and to No. 4, two bushels of bone dust. They all escaped the fly, and were treated alike. They were sown the 15th and 16th June, and harvested the 10th November. The product was as follows:

No. 1	yielded	98	bushels	= to 390	per acre.
No. 2	"	124	"	= to 496	"
No. 3	"	185	"	= to 740	"
No. 4	"	213	"	= to 852	"

Pitts's Grain Separator and Cleaner.

This machine was patented in June, 1837, to J. A. & H. A. Pitts, of Winthrop, Maine, and of course its merits or demerits can yet be but partially known to the American farmers. We had heard it highly spoken of; but as hearing is not seeing, and as it is our practice not to recommend any new implement till we are satisfied of its utility, we have waited for ocular demonstration before we would venture to join in its praise. But now, having seen it in operation some days, on our premises, we are prepared to give it our unqualified approbation, as an excellent machine for the purposes intended.

It is a thrashing machine and fanning-mill combined. It thrashes, separates the straw from the grain, and cleans and delivers the latter, in the best order, for the sacks or bags—*in one operation*. It may be constructed for the power of one horse or more, though usually adapted for two horses, attached to an endless chain power, though it may be attached to other horse or propelling power; and the whole is so portable, that it may readily be transported, horse-power and all, by a two-horse team, and put in operation on a twelve foot barn floor. The cylinder and bed are of cast iron, the former rendered doubly secure by strong iron bands. The teeth are wrought iron, secured by nuts, are not liable to do injury if broken, and are readily repaired. This we saw verified: a sickle, which had been carelessly left in one of the sheaves, passed undiscovered into the thresher. The sickle was cut into five pieces, and the handle slivered. The machine was immediately stopped, and the cap taken off, when it was found that one tooth was spoiled, and two or three others somewhat bent, the whole of which were replaced or repaired in a few moments. The fanning-mill may be detached in two minutes, and used separately. The whole of the machinery is substantial, not liable to get out of order, and may be readily repaired.

As to the quantity of grain which this machine will thresh and clean, the patentee assures us, that 100 bushels of wheat or rye, or 200 bushels of oats, is a fair day's work with a machine of two horse power; and the numerous certificates which he has, from respectable farmers in Maine, Massachusetts and New-York, fully sustains him in this declaration.

There are two prominent advantages in this machine, over others that we have seen in operation, viz.

1. It thrashes, separates the straw, and perfectly cleans the grain, at one operation, demanding only the additional labor of a man to bag the grain as it comes from the machine. And,

2. It may be used any where—under cover during rain, or in the open field during fair weather, as there is no scattering or loss of grain even in the field. This we consider an important advantage in the great grain-growing districts of the south and west.

We are happy to add to our testimonial of approbation, the like testimonials of the Rev. H. Colman, and and of Messrs. H. Grove and C. N. Bement, who witnessed the operation of the machine at our place, and who fully concur in the above statement.

The price of the machine alone, at the manufactory, in Winthrop, is stated to be $110, and including the horse power $200. Address J. A. or H. A. Pitts, at the above place.

Notices of Correspondents.

Blight of the Plum.—Roswell M. Lawrence, of Catskill, assures us that he has found a cure or preventive of the canker or blight in the plum tree, in a strong decoction of tobacco, made by boiling the tobacco in water. He washes with this the excresences, on their first appearance in a green state, and applies to them some of the tobacco. He has tried the remedy in three instances, in all of which, he says, he has succeeded. The disease is undoubtedly caused by an insect, which the tobacco destroys; but we should doubt if the tobacco would heal and restore to health and vigor the diseased wood.

Improved Fence.—The following paragraph should have been inserted in Mr. Allison's communication in our last:

"In comparison with the post-and-rail fence, the *improved* has two important advantages—by avoiding, first, the ruinous necessity of spoiling the rails by splicing or fitting the ends into the holes of the post, side by side; which splices decay long before the rail has done its service. And, secondly, the difficulty of replacing a post or rail which gets broken by either accident or decay. Stakes having two supporters in the ground, which prop each other, also stand *firmer* than a post, where the ground is soft. I think these establish its superiority to the post-and rail."

Silk Culture.—E. D. Cotton, asks our advice and direction, in regard to the silk culture in Michigan. Mr. C. will find numerous publications on this subject in the book-stores. The Silk Culturist, published at Hartford, Ct. and the American Silk Grower, published at Burlington, N. J. are almost exclusively devoted to this subject. Our advice upon this matter may be seen in No. 1 of vol. iii. of the Cultivator. We think it a business in which some will succeed, and some fail; and that success will, in a great measure, depend, as in every other employment, upon the intelligence and economy with which it is managed.

Watermelons.—The twenty-four seeds received from Mr. Poullain, of Georgia, all grew, and produced the best crop we ever grew of this fine fruit—some weighing twenty-five pounds. The *Mountain Sprout* is of peculiar fine and delicate flavor. Seeds will be distributed at the meeting of the State Agricultural Society in February.

Agricultural Fairs.—The propriety of publishing in the Cultivator notices of the annual agricultural fairs and exhibitions, held in the northern and middle states, has been suggested by a highly respectable correspondent. We thank him for the suggestion, and highly approve of the plan. As it is now too late to notice them for the current season, we will endeavor to do it another year; and to enable us to do so, we respectfully solicit information, in time for our July or August number, 1839.

Agricultural implements, &c.—W. Dinn, No. 17 Common-street, New-Orleans, seedsman, desires to buy, or sell on commission, any useful agricultural implements that may be adapted to a southern latitude.

Saxony Sheep.—Our friend, H. D. Grove, advertises forty bucks and sixty ewes, of the pure Electoral Saxon race. We believe there is no purer flock of Saxons in our country than Mr. Grove's, and we can speak of the owner as a gentleman of strict probity and honor. Address Mr. Grove at Buskirk's Bridge, Washington county, N. Y.

Lincolnshire Sheep.—A letter from our friend D. Cliff, of Carmel, Putnam county, says—"I can now, with the utmost confidence, state, after a trial of three years, having now a third generation of lambs, in all about one hundred and fifty of the cross and full bloods, that they have exceeded my most sanguine expectations. In their habits, and choice of food, they are not as delicate as other sheep, thriving and fattening on the most scanty and inferior keep. There is a briskness in their countenance and action, which, to every beholder, bespeaks for them at once their superior constitution. They must be seen to be duly appreciated. Six wethers and one buck, two years old, of my own raising, and two full blooded imported Lincoln bucks, one four and the other three, weigh together 1798 lbs."—an average of about 200 lbs. each.

Early Variety of corn.—H. C. Tainter, of Hampton, Con. wishes to advertise the public, through the Cultivator, of an early variety of corn, called the Clark corn, which was ripe the 24th August, ten or fifteen days earlier, he says, than the Dutton corn he planted along side of it, and he thinks the Clark corn the most prolific. We doubt not the Clark corn is early and prolific; but we will add, in defence of our favorite, the Dutton, that our crop was all fit to harvest in August, and that for product, when well fed, we challenge a competition with any variety. We have cultivated it eighteen years, and never had it injured by frost. *Our* kind of Dutton corn was *harvested* by T. G. Mather, Esq. of Middletown, Con. and his neighbors, in August.

Melon Seeds.—We have received seeds of *the* 55 lbs. muskmelon, from an unknown friend at Charleston, S. C.

Berkshire Pigs.—Mess. Brintnalls, of Canterbury, Orange, who have a stock of these pigs, from original importation, cite the following as the weights to which they have attained, at the ages noted: one under two years old, weighed 652 lbs.; one four years old, 702 lbs.; one three years old 780 lbs.; two eighteen months old, 432, and 432½ lbs. &c.

The Grain Worm and late sowing Spring Wheat.—We have received communications from M. M. Wake, and others, which concur in stating, that the spring wheat sown in April and the early part of May, has been seriously injured by the grain worm, in the infected districts; while that sown after the 15th and 20th May has escaped with partial or no injury. Mr. Hill, eighty miles north of Albany, sowed on the 25th April, and again on the 19th and 25th May. The first was a total loss, the second was but partially injured, while that sown on the 25th May wholly escaped the worm. It gives us pleasure to say, that in the northern part of Vermont, where this insect first appeared, ten or twelve years ago, the culture of wheat is being again resumed, with flattering prospects of escaping the ravages of the worm. By the way, the opinion has been advanced by naturalists, that the grain worm is not oviperous, laying its eggs, but viviparous, like the honey bee, bumblebee, &c. depositing its young. Mr. Henry Ellsworth, of Ketch Mills, Ct. has addressed us ten queries in relation to this insect, all of which have been anticipated, so far as we are at present able to answer them, in the Cultivators which we forwarded to him on the receipt of his letter.

A new Insect Enemy to the Wheat Crop, we are sorry to learn, has this year appeared in several districts, and done serious injury. It is represented to be a species of worm, about three-eighths of an inch long, and preys upon the matured grain, in the field and in the barn. As we have not seen the insect, we will be obliged for a description of it, and of its habits, from any gentlemen who has made it the subject of his observation.

Thrashing Machines and Horse-Powers.—We have half a dozen letters of inquiry before us relative to these We have said all we have felt justified in saying of those we have seen on trial. For these opinions we must refer to the Cultivator, and also for the address of those who vend them, the price, &c.

Bog Ashes, &c.—Charles H. Welling, of Lawrenceville, will find answers to his queries in regard to bog ashes, at pages 157, 174 and 190, of our fourth volume

CORRESPONDENCE.

The Lombardy Poplar.

Baltimore Co. Md. Aug. 15, 1838.

J. BUEL—Dear Sir—This tree, it appears, has recently sunk very greatly into disrepute, at least in many places, as an ornament and shade in our yards, streets, &c. It is highly probable, however, that the intrinsic excellence of the tree has been but imperfectly ascertained, and known to a very limited extent amongst us. In view of directing more special attention to some of the advantageous uses which may be made of it, I beg leave to communi-

cate the substance of Mr. Baughen's remarks made to me on that subject a few days since.

1st. The Lombardy poplar is a tree of quick and rapid growth,—few more so. 2d. Is adapted to either dry or wet soil. 3d. May be propagated with great ease from cuttings, from the size of a riding switch to that of a large wagon tongue. 4. Sends forth abundance of limbs, which may be amputated without injury to the tree. 5th. Splits kindly even through knots, and when well seasoned makes good fuel; and, in the opinion of some, it is nearly, if not quite equal, to chesnut for rails.

I imagine the tree might be turned to very great advantage by farmers, especially in districts of country where wood is scarce. In a few years whole forests would be produced from cuttings, which could be applied to the foregoing purposes. And let them be planted from 10 to 12 feet apart, where you want permanent fencing, and in a little time you will have substantial posts, into the side of which you may introduce your rail slightly, and one year's growth will bind them tight enough.

I am, dear sir, ELI HENKLE.

NOTE.—The above suggestions address themselves particularly to the prairie west. There is probably no tree which would be made to furnish a forest belt around a prairie farm so soon as the Lombardy poplar, and none, certainly, could be so easily propagated. As a shelter for crops, for farm stock, for a growth of other timber, for fencing and for fuel, it would soon become highly valuable. Cuttings almost enough for a forest, might be transported in a dearborn, or one-horse wagon.—*Con. Cult.*

Millers' Tolls—Crops.

Burlington Co. N. J. 8 *mo.* 27*th*, 1838.

FRIEND BUEL—I perceive in the last number of the Cultivator, that a correspondent over the signature of William A. Stone, accuses me, with a certain John Westley Luff, of justifying millers in taking extortionate toll, which, on my part, I deny being the fact; nor would I, upon any consideration, support them in taking more than one-tenth by *measurement*; neither can he thus make it appear, unless he can show where you have stated that they have taken more than the above proportion in like manner ascertained. And as I apprehend my premises have not been clearly comprehensible to his understanding, I will endeavor to state them as explicit as possible, viz. that the tenth, as above determined, with what millers in this district of country extract in the process of cleaning, (and that too without the waste of grain, as will be shown to your correspondent, or any other person at any time,) would, with the escape of fixed air, amount to more than the tenth-part of the original *weight* of the grain when taken to mill; and until he proves that there is no unavoidable diminution of weight in the grinding of grain, or that it can be attributed to some other cause more certain than the departure of fixed air, the which he has not even attempted to do, my statements remain sound and unrefuted.

And in reference to G. W. Luff, he says, "that if he gets more loose air, (I suppose he means atmospheric air, and presume the term to be his own, as it is not marked as a quotation, nor can I find it used in Blair's pneumatics,) in any species of grain than its circumference will contain, he will have to employ some artificial power to aid nature in her wonderful and mysterious works of its germination," thus substituting his own for the philosophy of Martin, who expressly says, "that this fixed air as it is roused, expands itself into about a million times more space than if filled before in the form of a dense body;" or in other words, in the position in which nature placed it "in her wonderful and mysterious works" of formation, and whose philosophy is as worthy of credence as the Rev. Dr. Blair's. And whereas, your correspondent appears better versed in the science of weighing air, according to the standard of Blair, than in correcting insinuated false principles, I will leave him to calculate what his wheat will lose by *fixed* air, for I do not comprehend by his communication, what atmospheric or loose air has to do with the just or unjust tolling of grain; and I will also just inform him, through your columns, that if he will favor me with the grinding of some of his wheat, I will toll it both *scientifically* and lawfully, as nearly as I am capable of regarding the weight after manufacturing.

Respectfully, DAVID WALTON.

P. S. We are extremely parched up by the drought; our corn in very many places nearly killed, and what little there is will soon require husking. There is no appearance of any buckwheat worth naming, neither can we prepare our ground for sowing wheat. Our pastures are assuming the appearance of winter, and what little there is of green herbage the grasshoppers destroy, and some fields of corn are considerably injured by them; they far exceed in number any thing of the kind we ever saw. Some farmers are, and have been for some time, feeding their cattle, and report says, cows may be obtained in the Philadelphia market for ten dollars per head. We had an abundant crop of grass, and an excellent time to gather it, or we should indeed be in a deplorable condition for our stock, as our ruta baga and beets are also very far short of an average crop. Hay, which in Philadelphia market but a short time since, would not bring more than fifty or sixty cents per cwt. will now command from eighty cents to one dollar. We have had no rain of any considerable consequence, for about two months. We have had one or two very trifling showers during the time, that seemed to revive vegetation for a day or two, and then it would again languish as before. D. W.

☞ The vexed question, as to the loss of a bushel of clean grain in grinding, might be easily settled by experiment.—Will some gentleman *see* a bushel ground, weighing it before and after grinding, and send us the result?—*Cond. Cult.*

Tolls Again.

Moorstown, Aug. 8, *mo.* 16, 1838.

FRIEND BUEL—The communication of William A. Stone, by way of refutation to an article under the head, "Miller's Tolls," in the May number of the Genesee Farmer, and June number of the Cultivator, I consider not quite correct, or at least not strictly adapted to that article. If he is dissatisfied with their deduction for toll, or standard of tolls, I conceive him perfectly right in communicating the censure. But, with all respect, I must tell him, in rejoiner to the individuals, (D. Walton and J. W. Luff,) he has fallen into an egregious blunder, by asserting that 60 lbs. of wheat contain no more than one bushel of loose (denominated fixed) air; and which, he says, cannot be proved by practical philosophy. And, says the writer, I further contend, that if these gentlemen get more loose air in any species of grain than its circumference will contain, he will be obliged to employ some artificial power to aid nature in her wonderful and mysterious works of its germination. Here I dissent with the writer, and cannot reconcile it with principles of the philosophy he has quoted. Blair, the author he cites, only says, 1,000 cubic inches of air weigh 324 grains, and it is 900 times lighter than water. The weight of the air being variable, a great number of experiments have been made by different individuals, with as many different results, but the above would probably represent nearly the mean.

Now it is a determinate truth in philosophy, that solid bodies contain a certain quantity of air in a solid or fixed state, which quantity differs in different species of matter; hence it becomes a consequent truth that this air constitutes a proportional part of their weight; and, according to Oliver Evans' observation is variable in different species of wheat, from 4 lbs. to 12 lbs. in 60 lbs. or one bushel of wheat. Again we have from the experiment of David Walton, a practical miller, the loss of weight in grinding rye, to be 3½ lbs. per 56 lbs. or 1-16 of the quantity ground. Can we, without a knowledge of the composition, analysis, and organic action of vegetable substances, conceive that this quantity of air exists in one bushel of wheat or rye, other than in a solid or condensed state, greatly exceeding its original density? Hence it appears evident, that the degree of heat generated by grinding with great pressure, disengages this fixed air, and causes it to leave the flour, thus greatly lessening its weight.—Now if the statements of these practical men give the true aggregate amount of loss in weight during the process of grinding, I think it cannot be accounted for any way better than supposing the loss produced by the escape of the fixed air. Yet I admit no treatise on philosophy is better established than that quoted by our friend from Rahway, but unfortunately, where he would wish to apply it, it has no application. Now, if he will brush up his ideas a little, he will discover that his philosophy and Oliver Evans' sustain little or no relation to each other.—The mere circumstance that the Rev. David Blair says, a bushel measure, or 2,150 2-5 cubic inches of air, will weigh a little more than 1 oz. 9 dwt. is no proof that one bushel of wheat does not contain fixed or condensed air.

These extortionate tolls (as he calls them,) may be a subject of controversy with the miller and the farmer, which I wish not to engage in, by bringing into requisition an unnecessary multitude of words; much less do I intend to dispute with our agricultural friend. He may tell us of our faults freely, but we will be careful not to see any of his if there should any exist. Most respectfully, thy friend,

SILAS WALTON.

Hard Times.

J. BUEL, Esq.—I have a number of periodical visitors, with whom I like to hold sweet converse; and no one whose return is anticipated with more pleasure than Mr. *Cultivator* from *Albany*. He is punctual, desirous of communicating all that is useful; and above all, frequently tells me what my neighbors say. When I last saw him he presented to my view the thoughts of "An Agriculturist" on "The Times," a title so full of meaning that my attention was more than once directed to the subject. I fully agree with the writer, that the *times* have not so much affected the *farmer* "as other causes." I would commend his views on extravagance, improvement of the mind, &c. to all with whom my visitor comes in contact.

It is fashionable, in some places, with agriculturists, to pursue just the same course that has been pursued the last half century; and if perchance any one deviates from the old trodden path, by way of experiment, the "cruel fashion" makes him a subject of ridicule, and damps the ardour of others, who might otherwise be inclined to think and act for themselves. Could not then "this trouble" be avoided by the "tillers of the soil," if they were not "under the dominion of this *hydra fashion?*" I hope to hear again from "an agriculturist" in reference to his crops, mode of ploughing, &c. and indeed anything that his experience may suggest on the important subject of agriculture.

I believe the *stigma* of being a "*book farmer*," has shut the doors of many in this vicinity, against the visits of the Cultivator, and other kindred works; but light is dawning, and as it increases, *hard times* with the agriculturist will decrease. W.

Westborough, Mass. Aug. 27, 1838.

Blight—Crops, &c.

Newark, Aug. 15, 1838.

DEAR SIR—I have long been making observations upon the fire blight in trees; and although the public has been much bored by ridiculous theories, and mine may be as much so as any one, I will venture to lay it before the public, through the medium of the Cultivator. To entitle a theory to the attentive consideration of the public, it should be based upon facts sufficiently numerous and varied, to make it plausible. To give all the facts upon which i have founded mine, would require more than the space of a singie letter. But I may give sufficient to call the attention of pomologists and horticulturists to the subject.

I impute this singular effect to the aphis, and I think its ravages are by no means confined to fruit trees, and that other shrubs and trees infected with these vermin, are victims of its influence, in a greater or less degree. The monthly roses in my green house, small shrubs in my garden, my quinces, paradise apples, as well as pears and common apples, are subject to the blight; and I have not yet noticed an instance of blight upon any tree that was not very much infested with aphides in the months of May and June. So satisfied was I upon this subject, that in those months I visited several gardens and orchards, and pointed out to those in company with me, trees that would be blighted, distinguishing those that would be slightly from those that would be severely affected. The event has justified my predictions in every instance. A seckle pear, of a friend of mine, has suffered much from this cause, in the three past years. I found not an aphis upon it this year, and there is nothing like blight upon it up to this time. This tree may die from a disease which is preying upon its root, but its top is yet vigorous and full of fruit. Now the question arises, how can this insect produce this effect? In various ways. By its minute puncture it may destroy the vessels of the tree and leaves, its excrement may form a varnish impermeable to the air, and thus destroy the absorption and exhalation of the part; or it may be poisonious, when taken into the circulation of the juices. Referring this disease to such a cause, will account, in some degree, why it is not constant. We well know that the prevalence of insects is variable. Some years more and some less, or for a series of years more and again less.

One other fact I will mention. I have an apple tree that has in years past been severely injured by the blight, which stands within a few feet of the flue of my green-house. Last spring, when the buds were swelling, they were covered and black with the aphis. When the wind was in the right direction, I threw tobacco stems and leaves into the stove of my green-house, and the smoke passing through the tree soon caused them all to disappear Not a leaf or limb is touched with the blight this year.

The present has been a most remarkable year for vermin of every kind. Striped squirrels, birds, caterpillers of every known and many unknown kinds, worms and bugs, have infested plants and herbage of almost every description. The curculio has been very abundant. I have lost all my plumbs, notwithstanding I killed hundreds of them. Do you know of any preventive to their ravages? How would it do to sprinkle salt, ashes or lime around the roots of the trees, to destroy their larva?

The extreme heat of July will very much injure

our late crops. The moisture was literally baked out of the earth. Corn crops must be light.

A friend the other day brought me the branch of an apple tree, on which there were two very large cocoons, and a green worm about five inches long, three-quarters of an inch diameter, just commencing his cocoon. Such mammoth silk-worms must be great feeders as well as great producers.

ISRAEL DILLE.

REMARKS.—We either misunderstand what our highly respectable correspondent terms blight, or we are obliged to dissent from his opinions as to the causes which produce it. That the aphides, and all other parasites, animal or vegetable, which abound upon plants, are prejudicial to their health, and often destroy them, is a position not at all doubted—for these parasites subsist on the juices, or sap, which is destined to nourish the plant; and the injury is in proportion to the quantity of sap which is abstracted. But what is termed blight in the pear, and often in the apple, and other trees of the Pyrus family, cannot, we think, be caused by an aphis, for this insect seems ever to be with us, while the blight of the pear often intermits for years.

Substitute for Spaying.

Ivanhoe, Campbell Co. Aug. 18, 1838.

DEAR SIR—I have been for some time an attentive reader of your valuable paper; from each page information is to be gained. In your last number, you instruct us how to perform the operation of caponing cocks, before which I knew not. And it is the above which prompts me to give you the following information:

The old method of gelding sows is not only very cruel, but quite disagreeable to the operator, as well as dangerous to fat animals. Now sir, the modus operandi in this neighborhood, as practised by myself lately, but much longer by others, is simply this: For convenience use a common goose quill as a tube, cutting off smoothly the small end, the other shaped as for a tooth-pick, to be used as a handle; then pass the small end down the vagina two inches or more, (according to the size of the animal,) through which drop six or seven shot, say No. 3, and your work is complete. Nothing can be more simple, innocent, or efficacious.

Should you think the above worth making known, you can publish it. Very respectfully, your ob't serv't. EDWARD B. WITHERS.

Modes and Profits of Strawberry Culture.

Narrows, L. I. Aug. 15, 1838.

Mr. BUEL—Having noticed an article in your August number, on the cultivation of strawberries, to which my attention has been directed for a number of years, and wishing that the public should receive all the light upon the subject which can be diffused, induces me to communicate what little knowledge I possess of the matter. The kind generally cultivated on Long-Island (where I reside) for the supply of the New-York market, I believe to be the early scarlet, and of these I have at present about three acres under cultivation. We generally transplant, and form our new beds in the beginning of May. Formerly the universal practice was, to transplant in rows from two to two and a half feet apart, the plants single from one to one and a half feet from each other in the rows. My present practice, and that of many others, is to plant them in hills about three and a half or four feet asunder each way, placing four plants in a hill, two and two together, about three inches apart. By planting in hills there is a great saving of labor, for it takes less time in transplanting, they are more easily kept clean by running the cultivator through them both ways, and there is less labor in hoeing; whereas, by the old method, when planted close, the cultivator could not be used in them at all, or at most only one way. The cultivator is run through them as late as it can be done without serious injury to the runners, hoeing them each time, and it is seldom, when judiciously done, they require it over three times. I have always, in my practice, found them when properly managed, to cover the ground with a sufficient number of plants to produce a good crop of fruit the next season. A piece covering less than a half acre, of last year's planting, produced this season over 3,000 baskets, containing nearly a pint each, which were sold in the New-York markets for $200. This, however, is an uncommon yield, and is seldom equalled or excelled. New beds almost invariably yield better than old ones, and produce larger fruit, although apt to be sandy after showers. It took nearly two acres of my old beds to yield the same quantity the half acre of new did. The soil I prefer for strawberries, is light sandy land newly cleared, on which no animal or vegetable manure has been used. On land of this kind, which has been prepared by previous crops, and on which weeds have not been suffered to go to seed and take possession, they will last four or five years, while on old land they are seldom profitable over two, and often but one.

The greatest enemy to the beds is white clover, which, in old lands, after the first year's bearing, generally gets possession of the beds and eradicates the plants. Land lately cleared is not often troubled with this grass; the great danger is from sorrel, but this is less destructive. Our beds cover the whole ground; there are no alleys, no clipping of runners, no digging the paths, no burning with straw, as recommended by some gardeners, for it is doubtful whether these operations would answer our purpose, whether they would be profitable and pay cost. At all events, our experience leads us to adopt the plan I have described. The only attention which I have found necessary and advantageous after the first year, is to pull up and destroy the weeds and grass, and to run a light harrow over old beds, early in the spring, when matted too thick with plants. As for manure, it is not customary for us to put any on. I once read an account of plaster being highly beneficial, which I tried, but it failed in improving them. Lime might aid in destroying sorrel, but have not tried its virtue.

Much has been written about male and female plants, and of the necessity of mixing them in the beds to make them fruitful. Now all this may be necessary with some varieties, but with the one we cultivate I can assure you it is not; no cultivator in my neighborhood, from which the New-York markets are principally supplied, that I have ever heard of, does it. I once tried an experiment, which appears to me conclusive. I planted a small bed in my garden at the time when the fruit commenced ripening, taking only such plants as had good and fair fruit on them, and no others. This bed produced the next year abundantly; they were all female plants, and no males in their vicinity to impregnate them. The male and female blossoms of this variety must be on the same plant, although to the eye no difference is presented in their appearance.

If you deem these remarks worthy of notice, you may insert them in your valuable journal; and if you desire it, I may at some future period describe the manner in which cucumbers, melons, &c. are cultivated among us for the supply of the New-York markets. Yours, TUNIS G. BERGEN.

We shall be glad to receive the proffered communications. —*Cond.*

Early Varieties of Corn.

Hebron Centre, Aug. 27, 1838.

J. BUEL, Esq.—I send you two ears of corn, picked this day from a neighboring field. Both varieties have been cultivated in this town for many years; the twelve rowed has been the most productive, until the two last seasons; the early frosts cut off the most of it before it had ripened. The corn, when ripe, is very hard, and weighs three or four pounds in the bushel more than the common flint corn; it is very compact on the cob, hard, and when ground produces the finest meal; it may be called the Rhode Island flint.

The eight rowed is a fine variety; planted in the same field, on the same day, and manured and managed in the same manner, ripened eight or ten days earlier than the Dutton corn, and now promises a production of twelve or fifteen per cent more. There are now standing several hills (planted for an experiment,) of this year's growth, without more than ordinary care, that are six inches high. Will you be pleased to give the three varieties a fair trial, and in due time report the result in your very useful periodical publication? My only object in making this communication, is to give the greatest reward to the laborer who cultivates the ground, and best obeys the command of God given to our first parents—go "*dress the garden.*" Could our citizens be induced to return to their primeval innocence and simplicity, the whole earth would become an Eden. With great respect,

J. S. PETERS.

☞ The samples noticed above, have been received.—They are, as represented, beautiful samples of yellow flint corn, the grain covering about nine inches of the cob. We regret that Gov. Peters did not note the day on which they were planted, as we can only judge of its comparative earliness by knowing this fact. Some of our Dutton variety was planted on the 19th May, and the crop harvested on the 22d Aug. being 93 days. In Maryland, and elsewhere, it has matured in less than 90 days.—*Cond. Cult.*

Culture of the Strawberry.

Loretto, Va. Aug. 18, 1838.

J. BUEL, Esq.—Dear Sir—The perusal of your interesting article on strawberries, induces me to offer my testimony in confirmation of some of the facts and opinions therein stated. Not that I can suppose any of your readers would desire better authority than your own; but because the value of all statements whatever, as to practical matters, will always be increased in proportion to the number of credible experimenters who testify in support of them.

The burning of strawberry beds is a very old practice. I myself have known it for nearly, or quite half, a century; have often seen it tried; and with such invariable success, that it is surprising it should not be general. But it must be done immediately after the vines make their first appearance in the spring, and no more straw should be used than sufficient for spreading the flame equally over all the plants. This process not only benefits the soil in some degree, and kills the seed of weeds scattered on the surface, but it retards the bloom, and thereby often saves the fruit from destructive frosts. It also secures a succession of fruit, which is better than cultivating an inferior kind for the purpose.

I can likewise vouch, from long experience, at least in regard to the claret-coloured hautboy, that, if you would have any fruit, you must plant male among female vines. This is the only variety known to me, which leaves the male and female blossoms on different plants; although others may do so, but I have never noticed it. As to the best proportion of male to female plants, I cannot speak with certainty, having tried only that of one male to 12 or 14 females. By the way, can you inform us *what are* the distinctive characteristics of the hautboy, and what the derivation of the name?* I know of only the following peculiarities, viz. leaves of a yellower green, with a rougher and more corrugated upper surface, than any other variety; fruit of a spicy flavor, a very fragrant smell, and scarcely any perceptible acid in the taste. The claret coloured and white are the only hautboys I have ever seen that answer this description. All the other kinds known to me, amounting to six or seven, have leaves of a deeper green, and smooth on the upper side; while the fruit, however variant in taste, is much more acid than the hautboys, has quite a different odour, and is invariably of a red colour, although exhibiting various shades of scarlet and crimson. In some of our Virginia gardens, one of our wild varieties has been introduced, which has this peculiarity: in pulling the berries, when ripe, they separate entirely from the stem, which saves the subsequent picking, which must be performed on all the others. In flavor none are generally deemed better, except the old fashioned, round, scarlet kind, which was almost the only kind cultivated in "the ancient dominion," forty or fifty years ago, and which may claim a preference, by prescriptive right, over all others—even in opposition to the long established *dictim*—"De gustibus nil disputandum."

Among the varieties mentioned by yourself, you speak of "*the Methven;*" and you say—"you had many that measured over four, and one that measured five and one-quarter inches in diameter." Is not the word *diameter*, in the foregoing sentence, a typographical error?†

As to the culture of this delicious and wholesome fruit, I can only say, that *some* is indispensable to the production of the best and greatest quantity, be the variety what it may. The "let alone" system, so fatally pursued by congress and our state legislatures in general, towards agriculture, which may truly be called the life-blood of every trade, profession and calling in society, is equally fatal to—*strawberries*, (if small things may be compared to great;) they *must* have some culture, or they can never be brought to their highest state of perfection. But in regard to this, each pursues his own fancy, for the fact is, that we have scarcely any thing among us which has the slightest pretension to be called *system*, either in gardening or general agriculture; our sons having been usually brought up to entertain a most ineffable contempt for that great bug-bear, *book farming*, which, of course, comprehends gardening amongst the things not to be taught by books. The fatuity on this subject may be reduced to a sort of syllogism, thus:

Our fathers and great-great-gandfathers farmed and gardened pretty well without books.

But we, their sons, and great-grandsons, are ten times as wise and clever as they were;

Ergo, we are amply qualified to farm and garden it too, ten times better than they could,—unaided *by*, and independent *of*, any and every thing that bears even the semblance of a book.

But thanks be to you, sir, and to all your able brother editors of agricultural papers, for the zealous, constant and judicious efforts which you and they are now making, in every part of the country, to awaken the Rip Van Winkle's of our class, from their long and deadly sleep. The fatuity I have

* The distinctive botanical character of the hautboy is—"Calix of fruit reflexed, [no other species possessing this character but the wood strawberry,] pubescence of peduncles and petioles much spreading." The specific name *hautboy* (elatior in botany) is supposed to be derived from its *high* growing habit. The hautboy is often termed the *musky* strawberry, from its musky fragrance.—*Cond.*

† This was an accidental error in the manuscript. It should have read "circumference," instead of diameter.

just stated, cannot last many years more, against such efforts to remove it; and that you may all live to see your most sanguine anticipations accomplished, in this respect, is the sincere wish of, dear sir, yours, very respectfully,

JAMES M. GARNETT.

P. S. There is a means of distinguishing the male from the female plants of the hautboy, besides that by the blossom; but I have forgotten it. Can you inform us what it is?

The Vermont Bee-Hive.

Hon. JESSE BUEL—Sir—In my communication, which appeared in the Cultivator, May last, relating to the construction of a *bee-house* and *bee management*, I recommended my mode of growing honey, in preference to the old mode of managing bees, where it was designed to facilitate their cultivation among those who would pay but little attention to them, dislike the task of hiving, and render them more safe from the destruction of the moth and other casualties, than the ordinary method by which bees are generally kept.

In all cases where it is convenient and desirable to the owners of bees to devote their attention, hive them where they swarm, and those who wish to realize a profit from this insect, by forwarding yearly a quantity of honey to market, I do freely, and consider it no more than justice due my neighbor, Mr. John M. Weeks, and the community at large, recommend the Vermont bee-hive, which is considered the best in use by a majority of the apiarians of this state, and is coming into general use in most of the states in the Union.

This *hive* was invented and patented by John M. Weeks, Esq. of Salisbury, Vermont, who has from youth devoted a portion of his time in studying their nature, and most assiduously for the last eight or ten years, in observing their habits and demonstrating facts; the result of which no doubt is opening a new era in bee management, from which the public must derive a great benefit.

He is considered the first apiarian in this state, and it is a matter of doubt whether there is one in these United States that has investigated the subject, and made so many discoveries respecting the nature and habits of this instructive little insect, as Mr. Weeks, who has been at several thousand dollars expense, in time, in experimenting, publishing books, illustrating facts, &c. &c.

When on a visit at his residence, a few weeks since, I could not but feel deeply interested in his illustration of facts, as exhibited to us by means of *full observing hives*, (glass, covered with wood,) neat and elegant as any parlor furniture; the chambers filled with the most pleasing and admirably constructed drawers of glass, and drawers filled and filling with beautiful honey, without bread, or any thing unpleasant in its appearance. These drawers are taken out and sent to market at any season of the year. He informed us that he usually obtained from his old stocks, from twenty to thirty pounds of honey in these drawers annually, and from his earliest young swarms, thirty pounds and over, without robbing them of their winter stores. The Vermont hive affords an easy and safe method of preserving the lives of the bees through the winter, without destroying any. He showed us a *feeder*, and the manner of using it. Through the means of this, the bees may be fed on low priced or sale honey. We noticed several healthy stocks, which he informed us were wintered entirely on Havana honey, and have yielded several boxes of clover honey this summer. We were also informed that the principal part of bee management depends on a knowledge of the natural habits of the queen and her influence; and no apiarian can at all times be sure to succeed in their cultivation, unless he has a thorough knowledge in managing them.

He also instructed us in his art of compelling the bees to make and keep on hand extra queens; how they may be divided into separate colonies when they have become too numerous, without swarming.

He showed us how the bees would transfer themselves when the age of their combs rendered it necessary, by a little aid of their owner, and urges, by many arguments, that bees should never be compelled to leave one tenement and take another.

We observed in one hive, that he had killed the queen and confined her therein. In this experiment, Mr. Weeks is about to demonstrate several important facts, viz: That there is no monarchical government in a hive of bees, nor domineering power in a queen; though the queen may be dead the bees will continue to work as well, provided her carcass be present; and that no young bees can be raised without a queen; the old bees never eat bread, &c. These experiments Mr. Weeks intends to publish, and their results; therefore I can only say, that it is an interesting system, which affords an agreeable amusement, a comfort and profit. He advances his opinion, that bees are susceptible of a high state of cultivation; that they will never flee to the woods and mountains, unless neglected by their owner, or through a deficiency in knowing how they must be managed; and that he had not lost a swarm by flight to the woods in seventeen years. One reason of the bees deserting for better quarters is, when the rays of the sun are direct it exhausts the air in the hive of its vitality. Mr. W. sells the common coarse wood drawers of honey, in Boston, at from thirty-four to forty-two cents per pound, by the quantity; and for his best glass and mahogany boxes, he receives a higher price.

Mr. Aaron Barns, of Rutland, states, that ten of his swarms in the Vermont hive, produced, last season, $75 worth of extra honey.

Mr. Week's last edition of books on the management of bees, have all been ordered, but another edition will probably be published the ensuing winter. He is ever ready to congratulate all those who may call on him—such as parties of pleasure, amusement, and profit, and none can leave without a taste of his bread and choice honey; in addition to a pleasing course of lectures on the natures and habits of the honey bee, and other insects, which are very entertaing, instructive and useful. Respectfully yours, SOLOMON W. JEWETT.

Weybridge, Vt. August, 1838.

Patronage to Agriculture.

Goshen, Aug. 27, 1338.

JESSE BUEL, Esq.—Dear Sir—If you think the following will subserve the cause of agriculture, you can give it a place in your valuable journal. It has always seemed surprising to me, that this country, which is so productive in the fruits of the earth, should have received in its agricultural department so little aid from its rulers. While patronage is extended with a liberal hand to the various mechanical arts, and improvements in machinery anxiously sought after, the parent art, upon which all others depend for their support, is neglected. I know that the fault, in some measure, rests upon the people themselves; but something should be done to elevate the standard of agriculture. The ancients took much more interest in the cultivation of the soil, than is manifested at the present time. The arts and manufactures had not attained their present state of perfection, and it was only by the tilling of the soil that the greater portion of the inhabitants were enabled to procure a subsistence. But their kings and princes, orators and great men, united in carrying the science to such a pitch of perfection as has not been seen since. A great many excellent treatises were composed upon the subject of which we ought much to regret the loss. The kings of Egypt were famous for their skill in husbandry, and for the improvement they caused to be made in that country. They caused drains to be made to convey the water of the Nile to the dry and arid tracts not usually irrigated in the annual overflow of that river. Of such utility were these improvements, combined with the fertilizing properties of the water brought from the Nile, that the country of Egypt, consisting of only 6,000 square miles, comprised, as we are told by Pliny, a population of 20,000,000 souls. This amazing fertility, although caused principally by the Nile, could not have benefitted the Egyptians in a very great degree, without the kindly aid and instruction of their rulers. Cicero, also, one of the first orators of Rome, devoted much of his time to agricultural pursuits. He composed many valuable works. Virgil also has immortalized himself in his Bucolics. But perhaps of all the kings recorded in history, Hiero, king of Syracuse, in Sicily, stands first as a patron of husbandry. He came in possession of the throne at the age of thirty, and found the country convulsed with seditions and corrupted by luxury. He soon succeeded in placing agriculture in honor among his subjects, who, whether high or low, rich or poor, applied themselves diligently to cultivating the soil. The consequence was, that in a few years the inhabitants of Sicily, a small speck in the Mediteranean, who were in the habit of importing nearly all their grain from the continent, had now a large surplus for exportation. This brought the wealth of the surrounding country into their own, and then into the pockets of the farmers. By means of these wise regulations, he also kept an infinite number of hands busy, which might otherwise have been employed to the detriment of the state. This is a policy which should (and it cannot be too often repeated) be the peculiar care of a wise and prudent government, but it is often sadly neglected. Hiero's laws were so excellent in this respect, as well as others, that sometime afterwards, when the island became a Roman province, the inhabitants were allowed to be governed by their own laws, the Romans not being able to substitute any thing better in their room.

And why, permit me to ask, may not the example of Hiero be imitated in this country? It is from the legislatures of the several states that we must look for encouragement, in a government constituted as ours is. They have begun to awake, and have done something, as is the case in regard to Maine, Massachusetts, Kentucky and Pennsylvania. But much still remains to be done.

The condition of agriculture at present, is somewhat analagous to that of our common schools.—Something should be done to give the useful science of agriculture its proper respect in the minds of men. Education and agriculture should go hand in hand. All improvements in the one should be met by improvements in the other. The power and influence of the general assembly, are acknowledged by many to be necessary in advancing the character and promoting the usefulness of common schools—Why should not that power and influence be exerted in forwarding the usefulness of agriculture, upon which so much depends, and in which so many are concerned? That august assembly, the senate of Rome, did not think it beneath them to bring this art to perfection, and why should the legislature of this country neglect so important a source of revenue? In the hope, dear sir, that this may not be altogether out of place, I remain your obedient servant. CHARLES STRONG.

Bone Dust.

New-York, Aug. 20, 1838.

In your number for August, you gave an article from the Aberdeen Journal, on the operation of bone dust.

The writer states, that "bones are phosphate of lime—that is, they are composed chiefly of lime and phosphoric acid." So far the writer is correct, but he goes on to theorize on the effect produced when crushed bones are mixed up with soil as manure, and here his theory is at variance with practical facts. He says, "When crushed bones are deposited in the earth, by the action of heat and moisture, the bones are soon reduced to a state of decomposition, and the original elements of which they are composed are thereby set at liberty to form new combinations in the great circle of revolving nature." He then goes on to say, that "the lime is left in its caustic state, deprived of its neutralizing acid; and the phosphoric acid is set free in the form of gas."

It is exceedingly easy for any flippant writer to produce a plausible theory; but when chemical action forms the foundation of a theory, the writer should be sure that the agents he employs are equal to produce the effects he ascribes to them, or his theory decomposes itself.

There are few materials more difficult to decompose than bones, or phosphate of lime. To decompose bones, they are first calcined, then ground to a powder, and are then mixed with forty per cent of sulphuric acid, in which state they remain for two days, being frequently stirred. The solution is then poured on a filter, and the liquor passing through is added to a solution of nitrate of lead—the white powder which forms is mixed with char coal powder, and has then to be exposed to a strong red heat in a porcelain retort, when the phosphorus distils over.

The affinity of phosphoric acid for lime, and the affinity of lime for phosphoric acid, is so great that none of the alkalies will take the phosphoric acid from the lime, and none but the most powerful acid will take the lime from the phosphoric acid. After all it requires several hundred degrees of heat to liberate the phosphorus.

In the process I have described for obtaining the phosphorus, the sulphuric acid combines with the lime, forming a sulphate of lime, and the phosphoric acid is liberated. I would ask the writer of Aberdeen, what acid there is in any soil sufficiently powerful to decompose phosphate of lime, and if the lime could exist in a caustic state after coming in competition with an acid sufficiently powerful to decompose the bones?

The probability is, that bones act merely as phosphate of lime, and that the only change which takes place when used as manure, is the rendering the particles so fine as to be held in solution by moisture, and in that state are taken up by the absorbent vessels of the plant. WM. PARTRIDGE.

J. BUEL, Esq.

Novel Premiums.

Lake C. H. Ia. Aug. 27, 1838.

J. BUEL, Esq.—Dear Sir—Not being blest with an overplus of gold and silver, I propose to offer a "barter trade," to any one desirous of obtaining a premium, upon the following proposition: I am the owner of sixteen lots, in one of the numerous new towns of the west. It was laid out in 1836, about three miles from the head of Lake Michigan, on the great western thoroughfare which passes the head of

the lake, between Chicago and Michigan city.—About $20,000 worth of lots were sold at the first sale, at prices higher than they now are worth.—Yet I find from the assessment roll of 1838, now on file in my office, that the average assessed value of my lots, is $55 each. The Buffalo and Mississippi rail-road, and a branch from the Lake Erie and Michigan canal to the Illinois canal, have been surveyed through the place, so that property is more likely to rise than fall. However, such as it is, I freely give, and if worthily won, I hope it may rise in value as fast as similar property has done all over the great west.

So, then, to the offer. I appreciate your remarks in the Cultivator, No. 6, on the great want of "Agricultural School Books." Now to induce some one to begin a series of such elementary works, that will have a tendency to learn American youth such things as are the most important of all things for them to learn, that is, how to support themselves and families by the labor of their own hands, I offer, as a premium, five of the above mentioned lots, to any person or persons who will publish a series of five numbers of an "Agricultural School Library," to be submitted to, and approved by you, or any other gentlemen that you may associate with you for that purpose.

And I will also give two of said lots, to any person that will publish another work, to be called, and to be what it is called, "The Farmers' Manual," to be also submitted to, and approved by you, and to contain such maxims and advice as will be useful to new beginners in agriculture, whether old or young; rules that will be useful to the wife as well as husband of such as are driven by necessity or choice from the employment in which they may have always been engaged, to take up the, to them, new employment of cultivation.

Thousands are deterred from attempting to earn their own living, because they *don't know how to begin*. Such would rejoice to have it in their power to procure such a book, as much as a navigator upon a strange coast would rejoice in procuring a new chart.

And in addition to the premium, I will subscribe for ten copies of each work, and take the agency of selling them without commission. Will some one, more able than I am, add to the premium.

And I will also give further premiums, to other objects that you will point out as worthy, which will tend towards the same object. That is, the promotion of agricultural education; for I am convinced that the great object in view must be accomplished upon the rising generation.

A thought strikes me of another work worthy of "a premium lot,"—an Agricultural Dictionary; to be used not only as a necessary accompaniament to the series of school-books, but as an invaluable work in the hands of every cultivator. I venture to say, that there are not one half of the readers of the Cultivator, (and no paper uses less unintelligable phrases,) who are not often puzzled to give the proper signification to necessarily common words.—And to youth, the common names of soils, earths, and parts of plants, &c. are all Greek. To prove it, select fifty words that are found in every agricultural work, such as argillaceous, silicious, phosphate, sulphate, hydrate, carbonaceous, stamens, stolens, et cetera, (including the "et cetera,") and ask fifty of the first persons that you meet, to give you an intelligible definition of them, and see whether the answers do not demonstrate a very great necessity for our agricultural dictionary. If the publication of one cannot be induced, let me ask whether a page of your paper might not be profitably devoted to that purpose. It is a great fault in all education, that we teach words without conveying any definite idea of their meaning.

One of the great benefits which I hope to live to see grow out of the formation of "the American Society for Agriculture," is an improved system of education throughout the whole country. I commend to your particular notice an article in No. 51, of the Franklin Farmer, upon "Agricultural Education."

What think you of a universal petition from all the friends of agricultural improvement and education in the U. S. to the next congress, for the establishment of a national agricultural school? Are we so much more of a warlike than an agricultural nation, that we endow a "military school," to the entire neglect of an agricultural one. Here, certainly is something wrong. "Something must be done,"—who will say, "something SHALL be done," and make the first step towards it by printing and sending a petition over the country for that purpose? The little that can be, will continue to be done, by your friend,

SOLON ROBINSON.

REMARKS OF THE CONDUCTOR.

The ardor and zeal displayed by our esteemed correspondent, in his several communications, published in the Cultivator—directed, as they are, to the substantial improvement of the mind and the soil, are worthy of all praise. And he has given above unquestionable evidence of his sincerity, in the liberal offer he makes to subserve these noble ends. The mind must be enlightened before the soil can be improved. To second this generous proposal, we promise to add $20 to each of the six awards proposed in the above communication. How much will you add, philanthropic reader?

Grape Culture.

Brooklyn, September 10, 1838.

DEAR SIR—In one of the late numbers of the Cultivator, Col. Spooner, of Hempstead, L. I. has furnished your readers with a detailed statement of the culture of the Isabella grape; and its conversion to wine. He justly remarks, that much is to be learned concerning the culture of the vine; to which I add, that its culture has proved, and will continue to be a most efficient aid to the temperance cause. Such considerations, therefore, must commend it to the attention of every philanthropist, and induce his aid in extending its culture.

The great enemy of the grape is the rose-bug, which appears when the vine is in blossom. The Colonel remarks, "in a few days after their first appearance, thousands are seen carrying destruction through the vineyard." The best remedy he could devise, he adds, "is to go among the vines early in the morning, before the sun has warmed them into activity, and they are then easily destroyed. A few mornings spent in this way, will clear the vineyard, as they are a short lived enemy."—The Colonel is fortunate, if his destructive visitors leave him in a few mornings; with us, in Kings county, they protract their visit for *weeks*.

Rose-bugs, in my neighborhood, have, in some places, entirely destroyed the crop, both this and the last season; while my grapes, which were nearly surrounded with *rose bushes*, escaped their ravages. It has been the practice of many, to remove rose bushes to a distance from the grape vine, but without success. The cause is evident, they attract the bugs, but they serve also as a trap to secure them. The Colonel's plan is doubtless the best, *when practicable*. He would find it difficult to *catch bugs* on vines trained to a great height, as they generally are in villages, besides, as they can only be caught when the morning dew is upon them, their extermination would require many mornings' labor, and in the mean time the blossom would suffer from their voracity. Col. Spooner's communication will, however, prove extremely valuable in villages and cities, by furnishing the mode of trimming the vine to thousands, who never would consult a regular treatise upon the subject, but would suffer the impositions of gardeners, who, by making a great mystery of the manner of trimming, contrive to extort large sums for a very trifling labor. And, en passant, I may add, that article alone is worth double the yearly subscription price of the Cultivator. The Colonel requests of your correspondents, information in relation to the culture of the vine, and inquires whether manuring is desirable? What kinds? and to what extent? &c. &c. His valuable article entitles him to any information on the subject your correspondents can afford; and I trust it will receive the attention it merits.

My experience has been too limited to afford full answers to his queries. With regard to manuring, however, there can be no doubt that ground cannot be *too rich* for the vine. What kind of manure is best adapted to the vine, requires the test of experience. I experimented upon three vines, a short distance from each other in like situations, and upon same soil—a rich sandy loam. To one I applied *liberally*, unleached wood ashes, three or four times a season; to another, animal manure; and to the third vine, I applied liberally, long unfermented barn-yard manure.

The animal manure produced a luxuriant growth in the vine, and enlargement of the grapes, which exceeded any thing I ever witnessed in the Isabella vine, notwithstanding the severe drought this season. The vine "ashed," was also luxuriant, though not equal to the first vine, but more thrifty than the vine manured with barn-yard dung. I do not believe that ashes are congenial to the vine in *all* soils, but in a sandy soil it certainly is. Animal manure, however, will answer in any soil, and I believe for any crop. To other vines I caused soap suds, &c. to be applied, which I have found of great service.

Few cultivators consider, that the roots of the vine extend along the surface of the ground as far as the vine extends above the surface, and consequently the vine receives its nourishment from a considerable extent of ground. I was requested, a few days since, to examine a vine, which appeared sickly, and upon which the grapes were withering, although not half grown. I was told that the vine had been "well manured." On examining I found that within two or three feet of the vine the ground had been made rich, but beyond that distance, the top soil had been removed, in levelling the ground, and of course the steril subsoil alone left to nourish the vine. I need only add, that the owner understood the culture of flowers better than the vine.

My mite of information on this subject, is furnished with the hope that it may call forth the necessary information in relation to the culture of the vine.

BROOKLYN.

N. B. Since writing the above, I have examined the vine to which I applied animal manure, and find that it has several small bunches of grapes just formed, being a *second crop*. This, I presume, is owing to the extreme richness of the earth.

Culture of the Mulberry.

J. BUEL—Sir—Considering your manifest anxiety for the progress and improvement of agriculture, and your known patriotism for American enterprise and independence, I am encouraged to venture a communication for your paper on the mulberry cultivation and the growing of silk, for the information and encouragement of those of your readers who have and are on the eve of commencing in the silk growing enterprise.

There is no necessity for saying, at this late hour, that the cultivation of the mulberry and the growing of silk, will soon become an important branch of useful industry, and a source of wealth to the United States, for it is already acknowledged by universal consent, that American climate and soil is as congenial to silk growing, and the sons of America as well calculated for agricultural and manufacturing operations, as any nation in the world.

You are no stranger to Yankee enterprise, and Connecticut perseverance, and you are therefore aware that they have done wonders in that state in silk growing operations for some years past, having realized a profit with no better food for the silk worm than the common white mulberry; but recently, however, the morus multicaulis was offered them, and they commenced testing its qualities and estimating its real worth, and their long experience in the use of the mulberry, had qualified them to decide correctly; and when they become thus satisfied with its superior quality and worth, and found, by experience, that the roots will endure our winters standing in the earth, and send forth an increased number of stalks every year they adopt its use, and push forward its cultivation with all their energy and skill, are now multiplying and vending it by thousands and tens of thousands, and, I am informed, many have commenced cutting down their white mulberry, and throwing them away, as no longer of use.

And, sir, I am prepared to say, without fear of contradiction, that the deliberate conclusion and doings of those so immediately and deeply interested, will speak volumes that nothing can prevent from being heard and felt in every part of this republic.

You are aware, I conclude sir, that a special committee of congress, in a late report, have informed us of more individuals and companies already engaged in this enterprise than is generally known, and in some states are companies extensively engaged in raising the mulberry, feeding the silk worm, and manufacturing silk goods of a superior quality, and with an encouraging prospect. And this same committee, in their report, speak decidedly in favor of this cultivation, and urge the propriety of increasing this business in every state, not only as a profit to those engaged in it, but as a source of wealth to the United States, which will add another link to the chain of our independence.

Very little is known in this region about the cultivation of the mulberry, or rearing the silk worm. Something has been attempted, a few years since, with the morus alba, (common mulberry,) but with little or no profit, the cultivators having no faith in the durability of the morus multicaulis, or Chinese mulberry.

There has been a prevailing opinion not only here but elsewhere, that the morus multicaulis is too ten der a tree to endure our northern winters, yet there has been some honorable exceptions to the opinion; and as its history informs us it was introduced into the United States from two different places, we are therefore induced to believe that one kind is hardier than the other, from the fact that the kind we have, endured well the two last winters.

We commenced the cultivation of this mulberry in the spring of 1836, with 250 small trees, and 1,500 cuttings, all morus multicaulis. The first winter we left 20 trees standing in the open field, and unprotected from the weather, and cut down to the ground 34 trees, covered the stumps with a trifle of straw manure. They all lived and did well. Those we cut down to the ground sent out from their roots, the next spring, an increased number of shoots, some of which, in that season, growed about seven feet high, the fall after which was last fall, we cut all our trees down

to the ground, and buried the tops in earth till spring, for cuttings and layers, in order to increase our trees more rapidly, and we have succeeded this season far beyond our expectations. Our trees will now number about 20,000, and an equal number of cuttings.

No tree or shrub that we have been acquainted with, is more tenacious of life or easier cultivated, or can be more rapidly multiplied than the morus multicaulis, and we consider the kind we have will endure our winters as well as our forest trees in general, under similar circumstances. It is to be desired that all our farmers commence the cultivation of the morus multicaulis, without loss of time, and we do think they would if they were more informed in reference to its worth, and ease with which it may be cultivated.

One of the letters accompanying the late report, say it is no more to cultivate an acre of land with the mulberry, than with corn. If each farmer would devote only one acre of land to the morus multicaulis, it would yield him from 100 lbs. to 300 lbs. raw silk a year, in proportion to the fidelity with which the cultivation and feeding is performed. But assuming the lesser quantity, (100 lbs. from an acre,) it would yield a greater profit than any other product from the soil.

If the farmer can be induced to believe that these estimates are correct, he would not fail to commence with the morus multicaulis, and we have estimations of this description so often repeated, and from sources that ought not to be doubted, we can hardly question but that the farmers will wish to embark in this enterprise, if they can know where the best kind of morus multicaulis can be found.—It is truly a scarce article, although many thousands have been imported, and hundreds of thousands grown in this country, yet the demand has not been supplied, and it is doubtful whether it will be for some years to come. The more that is known of its worth, the greater is the demand; although it multiplies rapidly it cannot keep pace with the call.

We can now spare a few thousand trees and cuttings, to those who first apply; and if any of your numerous subscribers wish a few hundred of each, the sooner they let us know it, the more sure they may be of accommodation. We have multiplied them so fast, that we will afford them considerable lower than we had to pay when we purchased in 1836.

A writer in the Farmer and Gardener, advises, as the result of experience, to purchase the mulberry in the fall of the year. He says, this mulberry is so tenacious of life, that if it is kept through the fall and winter buried in the ground to the depth of 9 or 12 inches below the surface, it will be just as fresh in the spring as when first taken up out of the ground; and then his trees or cuttings are on hand, and he can have the benefit of the entire season of growing, without that danger of delay others have suffered who put off their purchase until spring of the year; and the opportunity we have had has led us to the same conclusion.

We have fed a few silk worms every year since we commenced the cultivation of the mulberry.—We do not discover any necessity for the use of the hygrometer or thermometer. We find this worm to be an animal of life, and wants food for its support, and needs a rational proportion of attention, like other animals, and the better they are attended to the better will be the result.

Our second crop this year are now winding their cocoons in very good order. Yours, respectfully,

S. E. GIBBS & SON.

Troy, September 14, 1838.

Merchant Mills, Nelson Co. Va.
Sept. 10, 1838.

SIR—The drought in this region is distressing. Our clover fields would burn freely. Our corn crop will be considerably short of half an average crop. Our tobacco crop is nearly a failure; and added to all, on the morning of the 4th inst, we had a frost that killed vegetation entirely, in low frosty situations. "We are rather in a bad box here."

WM. MASSIE.

Turnip Culture.

Vergennes, Sept. 4, 1838.

WORTHY SIR—I perceive much said in the Cultivator, on the subject of raising the English turnip. I here state my method, which for five years has not failed. About the 20th June I go into my sheep pasture, and plough a piece of sward land, run a fence round it, and yard my sheep, 250 in number, six or eight nights, from sundown until sunrise.—By the 4th of July I sow the seed, harrow it over, follow the harrow with a hoe, and turn all the green clods; then yard the sheep several nights, until the ground is trod hard; then sow with lime, plaster or ashes, or any or all of them mixed. When the plants come up, if the fly appears, dust it over with the above articles in the morning, when the dew is on them; continue until the rough leaf appears, when the work is done, except thinning the plants.

I prefer a light dry loam. Such land will produce three crops of corn, wheat, flax, or what you please, in succession, with plaster. I take up a piece, and stock down one each year; by this process you rarely discover a fly, and if the field is surrounded with grasshoppers, none will enter.

REUBEN WHEELER.

Ketch Mills, Sept. 10, 1838.

DEAR SIR—I wish you to have the goodness to answer the following questions, relative to the mulberry:

1st. What is the present price of the Brussa mulberry, and in what proportion is the annual increase in good land?

Answer.—From 25 to 50 cents.

2d. How does its habits differ from the morus alba, and the multicaulis?

A. It is believed to be more hardy than either,—leaves intermediate size.

3d. Where can it be obtained?

A. At the Albany Nursery.

4th. Have you confidence in the prospect that the culture of silk will be a permanent business in this country?

A. Yes.

5th. What is the prospect for the price of the mulberry tree next season?

A. There will probably be very little variation in the price of the best varieties.

6th. What legislative enactments have been passed of late in Pennsylvania, for the encouragement of the culture of the mulberry?

A. A bounty has been offered on silk fabricated in the state.

Respectfully yours, &c.

HENRY ELLSWORTH.

To JESSE BUEL, Albany, N. Y.

Crops.

Johnsonsburg, Sept. 14, 1838.

DEAR SIR—Winter wheat came in first rate, although there was not as much sown as formerly, on account of the Hessian fly having destroyed much the year previous. There were no poor pieces, but a great many good. There is a worm, however, discovered to some considerable extent—as to country—not, however, having been very destructive this year. Winter rye-straw very fine—expectations before harvest, great—not realized however—much of the grain shrunken—not more, if half a crop. Oats light.—Spring wheat—some—very few pieces tolerable—the remainder *absolutely poor*—some say the fly injured it early, and the worm is found in much of it. The latest sown the best—the most of it much shrunk—rusted. Corn never looked finer or grew faster than it did here the forepart of the season, and the prospect was a super-abundant harvest. The drought, however, has hurt it some, but still our farmers say, there will be more corn in fifteen miles around, than there has been in any for five years past. Potatoes very poor—next to nothing. Buckwheat, on the low ground, cut by the frost, and seriously injured; on high ground, good—will be half crop, if not more. Pumpkins very few, and but few apples. Hay, reasonable quantity. The second crop of clover, for seed, very little—drought and grasshoppers ruined it.—There is a good deal of old corn in this county and Sussex—scarce any grain of any other kind, (old.) We shall be very far from starving.

We suppose the worm in the wheat is the grain worm, and many think it was brought here in the summer wheat. The most of the spring wheat was brought from near Utica, N. Y. last year—something like 250 bushels for seed—the most of it was sound, and the crops were good. A great deal more was sown this year, and the worm is in a great deal of it. Could the worm be brought in that way in the seed, or has it, in its peregrinations, reached us, and will it destroy all our wheat? I see nothing to save us yet, unless it be the quick lime, of which you appear to have some doubt. I fear that we shall be scourged heavily and severely, as this is a good wheat section. We wish all the information all the world can give us on this subject.

How long does this worm continue in any place? Is it a passing traveller, or does it delight to sojourn a long time in a place? It has just made its appearance here. Will it be likely to do much damage next year? Will you please to invite all the information that can possibly be obtained on this *all important* subject. Our farmers are preparing to sow largely this fall, as their wheat crops were so fine. I tremble for them. I fear the worm will be destructive.

There is a great deal of limestone in this section of country, and a great many low places, marshy, boggy, &c.; there are many large beds of carbonate of lime, said, by geologist Rogers, who surveyed our state a year or two since, to be a deposition from the water. It appears to be a bed of stiff morter. Much of it, Mr. R. says, contains 50 parts lime, 38 of carb. acid, the remainder sand, &c. Do you think this would require the action of heat to make it valuable as a stimulator. It has been used some, and always to a disadvantage, and I think always injudiciously, as too large quantities were applied in a place, so that vegetation was destroyed, by being thrown up to dry; and when dry it will become, by a little beating, very fine. There are millions of loads of it within ten miles of this place. But I must transgress no longer.

Yours, respectfully, R. BYINGTON.

P. S. Can Green's cutter be had in the city of New-York, or where? [Yes—at Thorburn's.]

[Mr. Byington's questions in regard to sheep, will be answered by letter.]

EXTRACTS.

Dry Rot.

THE PROPER SEASON FOR CUTTING TIMBER.

[*Abridged by the Baltimore American from Silliman's Journal.*]

"The marine establishment of our country has no more fatal enemy than what is termed the *dry rot* in timber, and we know of nothing which would be productive of greater practical benefit than the invention of a method by which it may be prevented. The writer of an article in Silliman's Journal, for April last, presents some valuable facts connected with the subject, the deductions to be drawn from which may be productive of highly beneficial results. After adverting to the superiority of the timber of ancient times over that of the present day in point of durability, as a matter ascertained, the writer proceeds to assign for it a reason which, he thinks, is to be found in the time of the year at which the wood is cut. An opinion has long prevailed that the winter is the proper season for cutting ship timber, but if the views of the correspondent of the Journal be correct, this long received notion is erroneous. To prove this, he adduces facts that have come under his own observation, which go to show that so far from its being proper to cut the wood intended for ship building, in the winter months, the more remote the time of cutting is from mid-winter or December, the better. He states, that in the year 1810 he had under his direction the preparation of the timber for a freighting ship, and that he caused it to be cut during the month of December of that year. At a subsequent period it was ascertained that additional pieces were required, some of those cut in the first instance not being fit for the purpose. At the time when the last cutting took place the leaves were full grown and the bark would peel. In July, 1811, the vessel was launched, and in the following autumn was sent to sea, and after the declaration of war was despatched to Middletown, Connecticut, where she remained until the peace in 1815. In the spring of the latter year, when she was to be fitted out for service, on examination it was found that the timbers which had been cut in December were so much affected by dry rot, as to render rebuilding to a great extent indispensable, whilst the pieces prepared when the trees were in foliage were perfectly sound. Such was the perfect condition of the timbers prepared in the summer, that the spikes which had been inserted appeared, on being drawn out, perfectly bright—those which had been driven into the winter cut portions being oxydized to a great extent. The ship sunk some years afterwards at sea, a miserable hulk, in consequence, as the writer thinks, of the rottenness of the portion of her bottom which had remained untouched at the time she was repaired.

"A case so striking induced our author to believe that the common opinions about winter cutting were erroneous, and caused him to make some experiments in order to test the cause of the dry rot, and being doubtful of the correctness of the botanical theory, according to which it is supposed that the sap recedes to the roots during winter, he took, in June, 1815, some pieces of oak cut in June, which he placed over a fire. He found as the heat increased, that on the ends of the sticks there appeared a wet circle describing the exact thickness of the *alburnum*, or portion of wood outside of the heart, and that steam rushed violently from the tubes of that part, whilst there was but a slight appearance of vapor over the heart wood. In December of the year he tried a similar experiment, and found the steam to issue from the heart wood, whilst the alburnum remained perfectly dry. From these experiments it appeared evident that in summer the sap is in the alburnum, and in the winter in the heart wood, whither it had been conveyed by some process of nature not understood, and not in the roots as had been supposed. Subsequent observations have proved to the writer, that when growing trees are trimmed in summer, the rot which ensues begins in the alburnum, whilst in those trimmed in winter, the

decay takes place first in the heart wood. In further support of the new theory, reference is made to the fact, that chesnut rails, which are usually made in summer, last a great number of years, whilst posts made of the same material, which are generally prepared in winter, rot in seven or eight years. As a mode of ascertaining the season at which the ancients cut their trees, it is suggested, that on examination of ancient timber it will appear, that the powder post, as it is called, and the dry rot, will be found in the alburnum, and that the interior of the heart wood will be found perfectly unaffected. The following experiment is mentioned as illustrative of the effect produced on the outer or inner portion of the wood, according to the season of cutting. Take two saplings, one of which has been cut in June and one in December. By placing a piece of each in the garret, and a piece of each in the cellar, it will be found in about three years, that in the garret the powder post will have appeared in the alburnum of the one cut in June, and in the heart wood of that cut in December, whilst, in the cellar, the dry rot will exist in accordance with the same rule. The conclusion to which the writer comes is, that June is the best time for cutting ship timber, and that in proportion as we recede from that month will be its liability to decay. The subject is one of vast practical importance, and there is reason to believe that the perishable character of the wood of our country used for ships, is to be attributed, in a very great degree, to the fact of its being cut in winter."

On an Economical mode of Furrow-Draining.

[*From the Edinburgh Quarterly Journal of Agriculture.*]

Every attempt at the introduction of economy in farming operations, if founded on practice, deserves commendation. On this ground, the following economical mode of making furrow-drains claims especial attention from those whose locality affords flat stones.

Suppose a piece of land containing two ridges, of 15 feet each, one whole ridge and two half ridges, divided by two furrows. The drain is made in this manner:—Gather up the ridges with a four-horse plough, to make these furrows wide and deep. If gathered from lea, a crop may be taken the year previous to the commencement of the drainage. This ploughing leaves the furrows 16 inches wide at the bottom, and if the furrow-slice *a a*, fig. 52, on each side, has been ploughed one foot deep, and laid over at an angle of 45 degrees, their tops will be 32 inches apart. A line stretched from the crown of one ridge to that of another, will give the depth of the ploughed furrows 22 inches below the crowns of the ridges. This ploughing is only a preparation for the ultimate making of the drain. The drain is then made in this manner, on strong clay soils, which alone can resist the abrading effects of running water. Leave a scarcement of one inch on each side of the bottom of the furrow left by the plough. Cut out the earth 14 inches wide, perpendicularly, with the common spade, 10 inches in depth, *b b*. Then throw out the bottom of the drain with a narrow-pointed spade, 5 inches more in depth, *e*, and 4 inches in width, leaving a scarcement of 5 inches on each side of the spade; and the cutting of the drain, whose bottom is now 37 inches below the crowns of the ridges, is then completed. The drain thus made is filled in this way:—Take thin stones, such as strong grey slates, or thin flags, and place them upon the 5-inch scarcements left by the narrow spade, as *d*; they need not be dressed at the joints, for one stone can be made to overlap the ends of two others. They form the top of the conduit through which the water in the drain flows under them. The drain then may be filled up in the usual manner, with the plough and spade. The expense of making this kind of drain is, for spade-work, 6*d*. per rood of 36 yards in length. A Scotch acre contains 32 roods of furrow, at 15 feet apart, which gives 16*s*. for spade-work; 12 tons of flags, of an inch thick, will cover the 32 roods, which, at 4*d*. per ton, is 4*s*. more,—in all 20*s*. per Scotch acre, including the laying of the flags, which is estimated in valuing the spade-work. Fig. 52, will give an idea of this drain, after the above description.

Fig. 52.

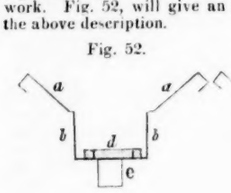
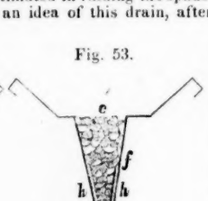


Fig. 53.



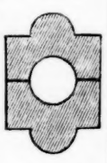
The drain represented in fig. 53, is thus made, and it is applicable to every species of soil. After ploughing the furrow, as already described, the spade takes out a trench from the bottom of the ploughed furrow, 8 inches wide at *c*, 16 inches deep *f*, and 3 inches wide at the bottom *g*. The depth will thus be 38 inches below the crowns of the ridges. This drain is filled with flags *h h*, set on edge, meeting at the bottom of the drain, reclining against the sides, and kept asunder by a stone of any shape, acting like a wedge between the flags, as represented in the figure. The remainder of the drain is filled with riddled stones, the riddlings being kept on the top, and covered with any matter, and then earthed over with plough and spade, like any other drain. The expense of the spade-work is about the same as of fig. 52; the stone-work will of course be more, but how much more has not been so accurately ascertained as to be confidently given to the public. Even at £2 per Scotch acre, this would be a substantial and cheap method of furrow-draining. T. S.

On Making Draining Tiles of Peat.

[*From the Edinburgh Quarterly Journal of Agriculture.*]

An ingenious spade has lately been invented by Mr. Hugh Caldarwood, Blackbyres, Kenwick, Ayrshire, for cutting draining tiles of peat. The instrument is worked very easily, and forms the tile with one cut of the spade; the tiles being cut *one out of the other* expeditiously, and without waste of material. Their shape is something like clay tiles, but more massy. They are dried in the sun during summer, lying flat on the ground, and may be stacked like peats, ready for use when required. When properly dried and hardened, wetness will not soften or decompose them. Peats are frequently found in mosses which have been buried long ago by accident, still hard and fresh; and those that have been used for draining upwards of thirty years ago, have been taken out of the drains unimpaired and solid. It has even been asserted, that a well dried peat has been boiled for six months in a boiler at Catrine Cotton-works, which was taken out after that period solid and uninjured. There is no doubt, however, of the capability of dried peat to resist moisture. The large stacks of peat formed for the use of families in Ireland, where coal is unusual or scarce, are never thatched. The invention of this spade tends to render the draining of moorish lands more practicable than hitherto, as with it a farmer may cast two or three thousand tiles a day, within a very short distance of the ground he intends to drain, at one-fourth or one-fifth less expense than he could furnish himself with the same number of clay tiles; the frequent want of clay in such districts rendering the manufacture of clay tiles at hand impossible; and the cartage of them from the kiln to a great distance to the land is at all times an expensive operation. When laid in the trench, the peat tiles are placed with their grooved faces opposite each other, one of them serving as a sole, as in the figure. We understand that a considerable number of Calderwood's spades have been working this season in Ayrshire; and if experience prove their utility, they will no doubt get into general use in peaty districts. Specimens of the tiles and spade have been lodged in the museum of those enterprising friends of agriculture, Messrs. Drummond, Stirling, and we believe they may also be seen in the hands of Messrs. Samson and Company, seedsmen, Kilmarnock.

Fig. 54.



The article which follows goes to prove three facts, of primary importance to the farmer, which we have strenuously endeavored to inculcate, viz:

First, That the resources for manure, on almost every farm, are sufficiently abundant, when properly husbanded and applied, to keep up, or improve, its fertility;

Secondly, That blending unfermented dung with earth, or the soil, accelerates its decomposition; while,

Thirdly. A vast amount of fertilizing matter is saved by such admixture being made, *before fermentation has taken place*—the earth "absorbing and retaining that excess of putrescent fluids and effluvia which is otherwise lost by filtration and evaporation; that is, by soaking away and drying up."

[*From the Farmer's Cabinet.*]

Manure.

WHAT IS THE GREATEST QUANTITY OF MANURE TO BE OBTAINED FROM GIVEN MEANS?

Mr. Editor—There are in agriculture, as perhaps in every science, some leading propositions, calculated in a particular manner to arrest attention by their prominent importance. Such I hold that of a "Subscriber" in your May number—"*What will an acre of land produce?*" and also the question which heads this article.

Were it possible at once to afford a complete and palpable solution to these two propositions, what mind can calculate the vast increase of treasures that would instantly become accessible to humanity? As, then, we cannot inquire too strictly, or know too much regarding them, I propose, after recapitulating a few of the principal statements of a "Subscriber," concerning the latter question, to furnish my own experiments upon the former.

He informs us that a single acre of his land, *with abundant manuring and superior cultivation*, was made to produce the sum of $348.40 per annum, for five successive years, besides the vegetables used in a small family. He further states, in substance, as his present conviction, that the quantity of soil cultivated has nothing to do with the secret of gathering money out of it; that "this altogether depends on a judicious selection of soil, *on the facility of obtaining manure*, and on the proper application of it as food for plants," &c.;—that he found, by actual experiment, made upon a large scale, "that the profit of capital laid out in land produced an interest of only *five* per cent per annum, the capital laid out in manure upon the same land produced *twenty* per cent."

Now, my own experience, as I shall presently show, abundantly comfirms the probable accuracy of all these statements. Let us distinctly understand, then, that it is not the great quantity of land, but *the abundance of manure* upon a little, that is alone required to give wealth and independence; that the man who owns five or six acres, may (according to the above data,) with the aid of manure and good management, draw from $1,800 to $2,000 from them each year, while he of a hundred acres may scarcely obtain half of it upon the common plan.

But where is the requisite manure to be obtained that shall so suddenly and surely enrich the farmer? In reply to this, I will simply give my own experience, and by it endeavor to convince the reflecting farmer what amount can, and in fact *has* been made from means incomparably more limited than is generally imagined possible.

Previous to 1829, I had followed in Philadelphia a sedentary occupation, which, by excessive application in it, had so enfeebled my constitution, that I was obliged to seek in the country for that measure of health which I might no longer hope for in the city. So I bought, with my scanty savings, a small place of ten and a half acres, and moved upon it the same fall of 1829.

Not being acquainted with farming, I hired a man to plough two and a half acres, and sow it in rye. The cost of seed and labor, in putting in, gathering and thrashing the said crop, was $8.56. The crop yielded five and a half bushels of very poor black rye, fit only for hay feed—say at forty cents per bushel, (as good rye was then selling at fifty and fifty-six cents per bushel,) was worth $2.20, and the nett loss sustained upon farming the ground was $6.36. The season was moderately good for grain, and the two and a half acres rather a favorable specimen of the rest of my land! I planted a potato patch the following spring, (1830,) of about the fourth of an acre, which I manured in the hills with one load of marl only, and the crop yielded but three and a half bushels!

Being a total stranger to the nature and character of soils, but having previously, from some cause, entertained the notion that land in general produced about twenty-five bushels of wheat, or forty bushels of corn, or four or five loads of hay to the acre, the conviction I had now received of the absolute worthlessness of my land fell upon me like the shock of a thunder-clap. Discouraged by the greatness of my disappointment, but not quite confounded, I determined that manure, in future, should be every thing to me, and stand in the stead of both land and crop. Being greatly improved in health, by the change of situation and exercise, I plied my avocation with increased diligence for the maintenance of my family, and made it the amusement of my leisure hours and leisure moments to collect from every corner, and pannel of fence, every thing that I imagined could furnish a vegetable nutriment, and placed it in the cow yard, so combined with the litter as to absorb and retain every thing of the putrescent character that might be deposited there. By such means I have gone on, every year increasing the quantity of my manure, to an extent that I believe astonished most of my neighbors. The following is a sketch of the means I possessed, and the methods I took to obtain manure for the present year.

I commenced last summer by collecting into the outer part of my hog pen every thing of the weed kind I could find about the place, till I had a layer about twelve inches deep, which I covered with a layer of earth about five inches thick, continuing the process till the pen was filled to about two and a half feet deep. In the fall I littered my loose corncobs and the principal part of the buckwheat straw into the pen, interspersed with layers of earth in the same manner. The two stalls of my stables I served also the same, taking care to save therein all the chaff and refuse straw after thrashing. In these stalls I poured weekly, through the fall and winter, (for I had no cattle in them except in bad storms,) the soap-suds and such putrescent fluids that might be obtained, keeping the corners and outsides, and under the mangers carefully saturated.

As soon as my corn was gathered in the fall, I cut the stubs close to the ground, and wheeled them immediately, *while yet heavy*, into the barn-yard, where I packed them in every part of it, and also under the shed, being an area of ground about forty feet by twenty, and in a few days covered them also with a layer of earth, from a fence-row, close by, to the depth of about eight or ten inches. Upon this earth I foddered my three cattle during the winter, occasionally depositing more earth upon the litter as it collected there.

Your readers will readily judge, that the object of all this preparation was not so much for the sake of saving the materials collected there as to obtain a menstruum, or rather *sponge*, if I may so call it, calculated to absorb and retain all the urine deposited in the yard during the winter. The compost masses, however, or layers, thus collected together, are not to be considered as manure prepared for the soil, but only as *materials* that require to be thoroughly *mixed*, in order to reduce them to a state fitted for a rapid and complete incorporation with the soil. Accordingly, with this view, I commenced late in April the operation of turning it, which, from its having become closely packed to the depth of twenty inches, with the stalks at the bottom, could only be done with the aid of a grubbing hoe, turning it in strips about a foot wide, reaching across the yard, and throwing the

loosened manure back a sufficient space to allow a trench between, wide enough to work in. After removing the whole cover from the stalks, along a strip, as before mentioned, they were easily grubbed up, by first cutting them through all along the solid edge of the strip with the hoe, it being made pretty sharp for the purpose. In addition to this pile of yard manure, I have also emptied the contents of my hog pen and stables, extending the pile several feet, and lying upon the ground, when first loosened, more than two and a half feet deep. Of this manure I have used sixteen loads this spring, for truck and garden, and, judging from the size of the pile yet remaining, there cannot be less than sixty loads, which, being turned once more, I intend to use for wheat next fall.

In this manner, from only three head of cattle, and the fattening of four hogs, I have made from seventy to eighty-two horse loads of manure, the highly fertilizing properties of which are abundantly attested by my own former experience. I will not say that it is stronger than the best barn-yard manure, but from its closer affinity to the nature of the soil, and greater facility for being rapidly combined and incorporated, without loss by evaporation, I have no doubt it will be frequently found, upon trial, more effective and more durable.

In the process of turning manure, thus prepared, I hold it of the highest importance to mix well the earthy and vegetable parts together. Few persons are perhaps aware how rapidly the earth facilitates vegetable decomposition, and to what a surprising degree *it absorbs the excess of fertilizing effluvia*, which must otherwise be evaporated during the process of decomposition. This circumstance, I believe, taken in connexion with the careful economising of all animal excretions, constitutes chiefly the great secret (I might, perhaps, add *alleged* necromancy,) that has added already so much verdure to my previously exhausted soil, and been so profitable to me, and so surprising to my neighbors.

No farmer can imagine, that has not tried the experiment, what a prodigious quantity of rich, vegetable, and fibrous earth may be collected from corners and by-places which lie out of the way of cultivation, and which, from their retired position, have perhaps, never so much as attracted his notice. All such refuse trash, and fibrous earths and weeds, by being conveyed to his barn-yard, at intervals, during the fall and winter, and judiciously combined with its contents, will be converted into a rich, fertilizing, and durable manure, merely by absorbing and retaining *that excess of putrescent fluids and effluvia* which is otherwise lost by filtration and evaporation; that is, by soaking away and drying up.

W. H.

Pittstown, Salem Co. N. J. May 20th, 1838.

On the Means of Increasing the Fertility of Land.

The productiveness of any soil, we think, depends entirely on its natural or artificial capability of retaining and transmitting its moisture, the vehicle at least by which nourishment is conveyed to plants. This productive power may therefore not only be continued in its greatest vigor, but greatly increased by proper management. When we by any means give to the soil a permanently increased vegetative power, we also increase the yearly produce which it yields.

Some soils produce large crops often repeated without manure, five crops of corn and a fallow are the conditions entered in some leases in the neighborhood of Wisbach in Lincolnshire, while other land will produce nothing without great expense of culture and manure, nor will an excess of manure make such land permanently productive; but if we change its constituent parts by the addition of those earthy materials of which it is deficient, so as to bring it nearer to the nature of those soils which we know to be fertile, then we shall permanently increase its productive powers.

Water being the vehicle by which nourishment is conveyed to plants, the soil, whose constituent parts is best adapted for retaining a sufficient supply and transmitting a proper portion in very dry weather to the plants growing in it without holding it in injurious quantities in the time of very wet weather, it is possessed of the principle of vegetation and will be found to be of the most productive nature. Such a soil will give not only firmness to support the plants, but will facilitate the growth of their roots in search of moisture and nourishment to the greatest depth.

There is not an individual who cultivates a garden and who exercises his judgment in its culture, but knows that the addition of clay gives cohesion to sandy or gravelly soils, and that sand and gravel when mixed with a clayey soil diminishes its tenacious property; and that these changes thus effected permanently increase the productive powers of both.

In our endeavor to improve barren soils, we should examine them in connexion with fertile soils in their neighborhood, on the same geological formation, and the difference of their constituent parts may lead us to the means of their improvement. If the cause of sterility be owing to some defects in their composition, these defects should be supplied. An excess of silicious sand is improved by the application of clay, peat earth, or calcareous matter, cold well rotten manure, and rolling or trampling with sheep or other stock, to consolidate its texture.

When clay is in excess, it is remedied by the application of sand, chalk marl, or burned clay, light unfermented manures, and perfect pulverization, to make the soil friable. An excess of vegetable matter as in peaty soils, in a dormant state, is corrected by burning, by the applications of clay, sand, calcareous matter, gravel, rubble, or anything heavy, to give firmness to the soil. Lime not only destroys the injurious effects produced by sulphate of iron, which abounds in some soils, particularly in those of a peaty and silicious gravelly nature, but is said to convert the sulphate of iron into a manure. None of these applications, however, will have the desired effect, unless there be first a perfect subsoil drainage of all superfluous moisture conjoined with a perfect tillage. To alter the nature and properties of the constituents of any soils may be more expensive than to manure it; but the effect of the former will be lasting, while that of the latter is transitory; the one permanently improves the nature and quality of the soil, the other only imparts a temporary excitement to force a crop for a year or two.

The materials necessary for the permanent improvement of the soil are seldom far off, and the expense, though in some instances considerable, is soon repaid by the permanency of its increased fertility; the manure applied afterwards has a much greater effect, the expense of cultivation is greatly diminished, and the capital laid out is soon restored by its yearly increased produce. By these alterations we store the earth with hidden and inexhaustible treasures, which, invisible to the eye, put forth their strength and give us the evidence of their presence by the effects produced on vegetation.

In the process of vegetation, nature supplies soil, water, light and heat; but the matter composing the soil may not be in such a state as to receive, and transmit these in such quantities as will produce a healthy vegetation.

Man may regulate the supply by the cultivation, and by altering the texture of the soil.

When the materials of which the soil is composed are in proper proportion, the soil is most productive; when any one of the ingredients is in too great a proportion, the soil is unproductive.

Pure clay, silex, or lime, we have before stated, are barren, if they are found alone; but if they are mixed together, having a due portion of water, the influence of the sun, and a proper admission of air, (which are the prime movers in vegetable life,) a fermentation amongst the materials is created; and if vegetable and animal manure in a state of decomposition be combined with these, the soil which was sterile when separate will become productive when combined, and this mixture of materials and mechanical alteration will change the texture, and improve the quality of the soil.

Neither the clay, the silex, nor the lime are decomposed by this process, but the soil composed of these materials in proper proportions has the power of combining with, and decomposing the vegetable and animal matter, the water, and air which it contains, and produce results which afford the necessary food for the growth of plants.

When the particles of earth which compose the soil are separate from each other, or well pulverized, it holds the greatest quantity of free or available moisture, and readily transmits it to the plants which are growing in it; but when the particles of the earth are closely packed together, like new made bricks, it neither can receive moisture, nor will it give out that which it already possesses.

Good soils are naturally possessed of certain powers, with which, by the aid of husbandry, we can produce certain effects; on poor sterile soils, these powers may be conferred by artificially altering their texture.

When the fluid in the soil is so connected with the fluid in the plant, and gives out to it a constant and healthy supply, then we say the soil is in good condition.

Manure applied to the soil increases its vegetative powers, but the way in which it acts is not well understood. The process of the small rootlets are so very minute, that no crude substance can pass through them; it can therefore, only be taken up by them in the form of water or gas, and be absorbed by the leaves.

Well rotten manure gives an unctuous or cohesive property; but when in a loose or strawy state, it gives a porousness or looseness to the soil.

All mineral manures, as lime, chalk, marl, sand, gravel, ditch mould, road scrapings, and earthy matter, act on the soil merely as an alterative, by changing the constituents of the soil and improving its texture, and by giving it an increasing power of imbibing and decomposing water, air, and organic matter.

The most abundant ingredients in soil are sand and clay, and as a mixture of the one with the other tends to improve both, nature has so ordered it, that these are generally found in great abundance near to each other.

In the plastic clay formation, extensive tracks of sandy soil are found lying upon the brick clay; the soil of which is greatly improved by lifting up the clay, and spreading it over the sand at the rate 100 cubic yards to the acre.

There is also a considerable extent of this formation covered with flinty gravel, mixed with clay and sand, with a thin covering of black mould or peat earth for its surface, which produces heath and furze.

This lies near the clay, and the whole of this may be greatly improved by trenching, or otherwise mixing the sand and gravel with the clay below. The most of this is near the chalk, and would be greatly improved by an admixture of 80 or 100 cubic yards of it per acre. Chalk or lime destroys the pernicious effects of the sulphate of iron in the gravelly soil, and makes the soil which was worthless, so productive as to pay the whole of the expense in a year or two.

Soil that is chiefly composed of finely divided or impalpable matter, is greatly improved by the application of small stones, gravel, or coarse sand; as this prevents the soil from collapsing or consolidating during continual rain.

All alteratives should be put on the land in small quantities at a time, or if in large quantities it should be when the land in fallow; and these should be well mixed by repeated ploughings, or by Finlayson's harrow, which is an excellent implement for loosening and breaking the the fallow slice. The best way of putting on small quantities of materials for altering the texture of the soil is to make a mixture of them with the manure you intend to apply to the field; and these ought to be well mixed by laying them loose together, turning them several times, and fermenting them in the mass. When this is properly done, it should be carted and spread on the soil when in fallow, and be ploughed in and well mixed, so as to be completely incorporated with the soil.—*Morton on Soils.*

Construction of Ice Houses.

[*From the Farmers' Cabinet.*]

The July number of the Farmers' Cabinet, contains a request for some one to furnish an essay on Ice Houses; as I have some experience on that subject, I freely communicate my knowledge for the benefit of the public.

I have erected several houses, principally for the purpose of supplying the citizens of Wilmington with ice, and find the larger the house the better it will keep; and that those constructed under ground are much preferable to those built in the open air; and further, that a wet, humid atmosphere, is more destructive to ice than hot weather. In making an ice house, you first dig a cellar in the side of a hill the dimensions that you wish to make your house; the only rule to observe in this operation is, to make the cellar so that it will not hold water. If the situation is sandy, or if you come to a vein of sand about the time you arrive at a proper depth, no further care will be necessary; but if you find a stiff clay or earth of any kind impervious to water, you must make an outlet or abandon the place. This outlet may be constructed in several ways; if on the side of a hill, dig a drain and make it air tight by an inverted syphon; or the water may be drained into a well and pumped out, or you may sink a small shaft in the bottom of the house until you come to sand, and fill it up with stone. When the cellar is finished the walls may be made of stone, brick, or wood, to suit the convenience of the builder, always leaving a space of 8 or 10 inches between the sides of the building and the earth, to fill in with tan, charcoal, straw, cornstalks, or any other non-conductor you can get, but tan is by far the best article yet known.

Where expense is no object, the cellar may be made round, and the sides of brick, raised a few feet above the ground, and covered with zinc, sheet iron or tin, and some fancy ornament for the top.

A house 9 feet square in the clear, and 9 feet deep will hold 27 cart-loads, which will be sufficient for a large family. It may be erected in a few days by a handy laboring man, with the materials that can be found upon almost every farm. Dig a cellar, say 10 feet square, and 10 feet deep, then cut small timber from the woods the proper length, and build them up in the cellar after the plan of an American wooden house, keeping the space between the logs and the earth well filled with straw; raise the building two or three feet above the surrounding ground, so that the water will not get into the house, thatch the roof, and leave the gable ends open, for ice houses are often made too close at top, cover plentifully with straw, and you will have an abundance of ice through the season.

If the bottom of your ice house is clay or hard earth of any kind, it will be better to put in a few loads of coarse sand previous to filling the house. There is some difference of opinion among people acquainted with keeping ice, in regard to the construction of the upper part of the building, whether there should be a tight floor over the ice or not. My opinion is in favor of covering the ice well with straw and leaving the house ventilated at the gable ends, at least so open that the gas escaping from the ice will have an opportunity of passing away. SUBSCRIBER.

Theory.

[*From the Farmers' Cabinet*]

No man, however much he may repudiate theory, engages in any work without first having the theory of it established in his mind. Theory precedes practice as thought precedes action. One farmer spreads his manure a long time before he ploughs it in; another ploughs it under as it is spread, and another uses it as a top-dressing, while some are particular as to the time of the moon, when dung is put on the soil. Each has his theory and acts agreeably to it, and his success is not dependent on his having *no theory* at all, but on his theory being in accordance with sound reason; for there is always a reason why one way of doing a thing is better than another. Some allege that every thing that is printed about agriculture is mere theory, and therefore to be disregarded; those

who entertain this opinion, certainly maintain a very unsound *theory*, and the sooner they sift all the knowledge they possess and have gained by their own individual and unaided exertions, from what they have obtained by reading and conversation with others, the sooner they will ascertain the sum total of their *ignorance*, which it is expected will so alarm them that they will see the necessity of rubbing some of the roughest of it off. O.

Practice vs. Theory, or the Hands vs. the Head.

[*From the Farmers' Cabinet.*]

"No divorce, I beseech you, my friends."

Having recently been present during a very interesting and amusing conversation between two farmers, about your "Farmers' Cabinet," I will undertake to give you some account of it, or at least a short abstract of the subject matter of it. They were both good, and pretty intelligent farmers, but their views of some things, and particularly of matters written or printed in regard to agriculture, were as different as the two sides of a bake-iron. The one was descanting on the benefits and advantages of the Farmers' Cabinet to farmers generally, and now and then he read a racy article from it to prove his position; the other contended that any thing printed on the subject of farming was mere *theory*, and of no use, but rather calculated to lead people of little experience astray from the good old way of doing things that had been practised from the earliest times. He said that these printed things only dissipated people's ideas and withdrew their attention from work, and he thought were ruining our young people by keeping them thinking all the time instead of working. On the other side it was contended, that teaching people to think enabled them to work to much greater advantage, and that all the improvements which had been made in the world, were the result of thinking, and that thinking was not at all incompatible with action, but on the contrary, was the very base and foundation of it, and that a discovery or improvement being made, the promulgation of it in print was doing the greatest good to mankind, as it tended to keep up the equilibrium of knowledge, and enabled one man to work with the tools of another without cost. At last the contest assumed the form of a regular combat between the Head and Hands; a little on the plan of that detailed by Esop, of the quarrel that took place between the Belly and the Limbs, when the latter fairly rebelled, and refused any longer to work for a fat and indolent Paunch, which they considered as entirely useless, and unable to provide for itself.—However, after a short trial, at keeping up separate establishments, finding it not to answer expectation, a truce ensued, and they agreed to go on amicably together, and found a mutual advantage in it. Now I suspect this contest between the Head and the Hands will terminate in the same way, by each returning quietly to the performance of its appropriate duty again, as members of the same indissoluble firm of "Head and Hands," each attending to its own department, while they are both working for the common good; for I should like to know what sort of a farmer a man would make either without a head or without hands. I was thoroughly convinced by the arguments of the parties, that every man in this free country has an undoubted right both to think and work, either jointly or separately, as much as he pleases, and that there is not much danger of our carrying either to excess; but above all I was confirmed in the conviction, that every intelligent farmer should write down the results of his experiments, and the cogitations of his mind, on agricultural and rural affairs, and forward them for insertion in the Farmers' Cabinet. X.

Science of Gardening.—*Continued.*

[*From the Alphabet of Gardening.*]

LIGHT.

It is common with gardeners to expose their tender frame plants gradually to the open air, by taking off the lights from day to day, for the purpose, it is said, of rendering them more hardy. Few of those, it is probable, who do so, are aware of the principal agent which renders the plant more hardy, and which, if I mistake not, is generally supposed to be cold or fresh air. This, there can be no doubt, assists in the process, and is indispensable to its perfection; but there can be as little doubt, that light is the main agent, as a few facts and a little reflection will prove.

The process of blanching salads depends chiefly on depriving the plant of light, by earthing up a portion of the stem, as practised with celery; by tying up the tops of the leaves, as is done with lettuce; or by covering them with inverted pots, as is done with sea kale. In all these cases, the plants are crisp, watery and tender, compared with others not thus treated but similar in all other circumstances, which are stringy and tough in their fibres, less juicy, and therefore hardy. No exposure to cold or fresh air would produce this toughness and hardiness, if the plants were kept in the dark; and no absence of cold and fresh air would produce blanching, if a strong light were admitted.

Complete blanching is only produced by complete exclusion of the light; but its partial exclusion causes plants to be pale and sickly, as in the shade of thick woods, or plants in a stove or green house accidentally placed so as to be shaded by others. In all such cases, plants are popularly said to be *drawn*, that is, they endeavor to push their branches as much as possible into the light, and being from deficiency thereof proportionably feeble, they increase in length without at the same time acquiring strength. A potato in a dark cellar will in this way send out shoots of some yards in length, but not much thicker than a writing quill. It is on this account, that the glass frames in hot-houses ought to be as thin as possible, and therefore iron is preferable to wood. More light also will pass through a sloping or level frame than through an upright one, and through a domed or curved roof than one that is plane; because the rays of light always go in straight lines from the sun.

This singular propensity of plants to turn to the light has been supposed to indicate something akin to animal instinct; but when the cause is closely examined, this will not appear to be better founded than that of a piece of writing paper bending into a semicircle when held to the fire; for both the motion of the plant and of the paper depend on the same cause—namely, the hardening and stiffening of one side, while the other remains soft and flexible. In the case of the paper, the side next the fire has its moisture carried off by evaporation more rapidly than the other side; and in the case of the plant, the side most exposed to the light is in the same way rendered more firm, contracted, and shorter than the one less exposed. The very long shoots of the potato in the dark cellar seem to be caused by the softness of the blanched substance offering no resistance by contraction to the lengthening out of the parts.

It will follow that all colour, flavor, smell, and nutritive qualities, depend for their production chiefly on the action of light. The red colour of forced rhubarb, which seems to be an exception, arises from the red matter previously produced by the agency of light being carried up from the root.

It hence appears, that the study of the laws and action of light is of the first importance to a correct knowledge of scientific gardening, as will further appear when we come to consider the use of leaves.

HEAT.

As it has been shown that the food of plants, in order to be available, must be fluid; and as heat is the cause of fluidity, its primary importance to vegetation must be obvious, for no plant could take up frozen liquids. The processes, moreover, of fermentation and putrefaction, by which are produced the supply of carbonic acid gas, humic acid, and nitrogen, indispensable to vegetation, cannot go on without warmth. It is well known, for instance, that beer cannot be brewed in frosty weather, because a due degree of fermentation cannot be effected on account of the cold.

The effect of heat on plants is very beautifully proved by the experiment of Du Hamel, on the rising of the sap in vines in spring. On a frosty day, when the sun shone on a cut vine, the sap flowed on the south side exposed to the sun, but not on the north side where it was in the shade. In Canada, also, where the frost recur, though on the south side the bleeding goes on, at least during sunshine. It is on this account in some northern climates, where the long sunny days succeed the thawing of the snows, as in Norway and Russia, that the gardeners are said to shade their wall trees from the midday sun in the spring, to prevent the sap being prematurely raised and again checked by the certain cold of the succeeding night, a contrivance which also retards the flowering till there is less danger from spring frosts. Such shelter will also be beneficial in protecting from the dry winds of spring.

Did these effects of heat, which must also in part be atributed to light, require any proof, it may be shown by two wine-glasses, the one filled with hot and another with cold water, in each of which is placed a similar hollow straw so as to discharge the water, when it will be seen that the hot water flows more rapidly than the cold.

The soil in this country, below where the frost usually penetrates, averages a temperature of 48°, or 15° above freezing, which is the reason why springs do not freeze, and not any quality in the spring water, which will freeze readily enough when taken from the well.

It is of the utmost importance to be acquainted with what is termed the *radiation*, that is, the spreading of heat, which arises from heat passing from a hot body to a colder one near it, as uniformly as water runs down a slope. This spreading of heat takes place between the surface of the ground and the air; and when the air is cold, though the soil be warm, it soon loses its heat, and dew or hoar frost is formed on the grass by the moisture diffused in the air, though previously invisible, becoming condensed or frozen. But when the sky is covered by clouds, this spreading and loss of heat is in a great measure prevented, and hence there is no dew or hoar frost formed on a calm cloudy night, as was first remarked by Aristotle.

It is on this principle, that garden plants are protected by matting, which stops the heat of the soil from spreading about and being lost in the air. Dr. Wells proved this principle by stretching a very thin cambric handkerchief two feet square, six inches above a grass plot; and he found on one night that it was five degrees warmer under the handkerchief than the rest of the grass plot; and on another night there were eight degrees of difference. Hence, great thickness does not seem to be so important in such cases, as the interposition of any screen whatever between the soil and the sky, provided always that the screen does not touch the soil or the plants to be protected. In this case it might carry off heat by conduction.

It is on the same principle that snow affords a protection from the severity of frost, the plants under snow having been found by Dr. Darwin to indicate forty degrees, that is eight degrees above freezing; hence some Alpine and Siberian plants, such as auriculas, do not bear exposure to frosts when unprotected by snow, so well as those which are natives of a warmer clime, and require artificial shelter.

It may be remarked, that hoar frost is never seen on a sloping hedge bank, on the side of an earthed-up row of celery, nor close to a garden wall, unless when the surface is already frozen, and that such places are always the first to thaw, beginning with the summit of a slope, evidently because the slope is unfavorable to the spreading of heat, while the garden wall stops it, in the same way as Dr. Wells's handkerchief did. Hence broad coping stones on walls are excellent for protecting wall trees.

Another reason for a slope or a hill being warmer than a valley, is that cold air being heavier than warm air, the coldest air, always rolls down to the lowest situation; but if there be a brisk running stream in a valley it will prevent, in some measure, the stagnation of cold air; injurious, because the greatest cold always occurs in air having the least motion. Prof. Daniell says he has seen a difference of 30 degrees on the same night, between two thermometers, one placed on an elevated situation and another in a sheltered valley. The shelter of walls may, therefore it would appear, be so arranged as to prove injurious rather than beneficial, by causing the air to stagnate and become cold, as it does in sheltered valleys during the night.

The evaporation of water is so strongly productive of cold, from the water requiring much heat to expand it, which it of course carries off into the air, that in the hot climate of India, ice is, for the purposes of luxury actually procured in considerable quantity, by exposing unboiled pump water in broad shallow earthen pans placed on dry straw on calm cloudless nights, to the open sky.

It is from the rapid increase of cold by evaporation, that we account for the injury produced by watering plants when a warm dry wind blows, or during bright sunshine, which is popularly termed *scorching*, though it is not the heat that affects them, but the cold caused by the water carrying off the heat as it arises in form of vapor into the air. Miller is undoubtedly wrong in supposing it to be occasioned by the sun's rays being brought to a focus, as in a burning glass, by the small globules of water, for these globules, from their touching the plant, cannot bring the rays to a focus.

The injury caused by the melting of hoar-frost or frozen rain on plants arises from a similar cause, the carrying off a portion of heat from the plant in order to render the frozen water fluid.

The amount of evaporation depends on the quantity of moisture in the air, and the rapidity of its motion; or, in other words, on the velocity of the wind. Over the first the gardener has little or no control; but he can, by means of walls, palings, hedges, and other screens, obstruct or stop the current of the wind; or natural shelter may be found in uneven ground. Professor Daniell states that the same surface which, in a calm state of the air, would give off 100 parts of moisture, would yield 125 in a moderate breeze, and 150 in a high wind. The dryness of the air in spring renders the effect most injurious to the tender shoots of this season, when it is desirable to shelter gardens from the easterly and northerly winds in particular, by means of high walls placed not too far asunder.

I need scarcely allude to the extensive use which is made of artificial heat in rearing the plants of warm climates, as well as in the various modes of forcing, for proof of its being of the first importance for every gardener to study the laws by which its distribution is regulated, and the means by which this

may be artificially economised in gardens both in the open ground and in plant houses.

INJURIOUS SUBSTANCES.

Plants are precisely similar to animals in respect to injuries caused by too much or too little food, as well as by what is of a deleterious or poisonous quality.

It is accordingly found that among the substances just mentioned as constituting the wholesome food of plants, they are injured by too much or too little water, and by too much or too little carbonic acid gas, and by too much or too little light or heat. Saussure found that when he confined plants in carbonic acid gas, they were as much injured as the consumptive patients whom Dr. Beddoes caused to breathe oxygen, which, in due quantity, is indispensable to health. Food, indeed, which is rich, concentrated, and without a due mixture of what is less rich, is injurious to both plants and animals; and, hence, plants will not thrive on distilled water largely mixed with carbonic acid gas without atmospheric air, or at least nitrogen to qualify it; any more than a man will thrive on nothing besides rich beef tea without bread or other qualifying substances: dogs have actually starved to death by feeding them on nothing but rich soup.

When, on the other hand, there is not sufficient water, every body knows that plants will wither, and when not enough is carbon, it is equally ascertained that they become pale or yellow; while a deficiency of nitrogen to cresses, cabbages, mustard, and turnips, will render them vapid and deficient in flavor.

Besides these causes of injury, there are certain substances which act even in smaller quantities as direct poisons. Arsenic, for example, will completely destroy the life of a plant, or of a seed, and M. Leuchs proved that the nine thousandth part of a grain was hurtful. Opium, likewise, will put the sensitive plant to sleep in half an hour, and laudanum will kill a kidney bean in one day. Cherry laurel water produces effects similar to arsenic. Iron, in the form of oxide, at least, when in any considerable quantity, is by no means favorable to vegetation, though iron finds its way in minute portions into most plants, and may be observed in some vegetable ashes in the form of the red oxide, or rust. It may be observed in the same form in soils of a reddish brown colour, many of which are far from barren; though they certainly do not owe their fertility to the iron, but are fertile in spite of it, owing to some other causes.

De Candolle seems to doubt iron being injurious, but the experiments of Dr. Home put this beyond question. One drachm of copperas, or sulphate of iron, in the rich mould of a garden, killed some plants of barley when an inch high; and he found most dark coloured infertile under soils, or *till*, owed their barrenness to iron. This result was confirmed by Sir H. Davy, who placed a primrose root in a solution of oxide of iron in vinegar, which soon acted as a poison and turned the leaves yellow; and he proved that the iron had entered the plant by testing the decoction with infusion of galls. Plants, as I have observed, which are grown by cottagers in old iron, or white iron pots, do not thrive, no doubt from the same cause, and it may be partly on the same account that granite soils are infertile.

Magnesia, it has also been found, is poisonous to plants; and hence, burnt lime from the limestone containing magnesia, as about Belfast, Durham, and some parts of Yorkshire, Derbyshire, Leicestershire, Shropshire and Somersetshire, when laid upon land, has been found to prove very injurious. It may be, that the small particles of the magnesia, which are insoluble in water, and do not readily attract carbonic acid gas, get into the minute suckers at the tips of the root-fibres and obstruct them, though no solid substance whatever can get into a plant; for it is found that when mixed with fat peat earth, magnesia does good rather than harm, because, in this case, it finds abundance of carbonic acid gas, by which it is converted into a carbonate of magnesia, that will partly dissolve in water by means of humic acid, and, consequently, supply plants with wholesome nutriment.

It must be evident, that besides having a due quantity of wholesome food provided for plants, this must be so placed as to be within reach of the suckers of their root fibres, since they cannot move about in search of it themselves; a subject, which, with some others may be treated of under the head of PAYSICS; a term now commonly used, and pretty generally understood, to comprehend explanation of facts from mechanical, as distinguished from chemical, principles.

The happiness of the human race, in this world, does not consist in our being devoid of passions, but in our learning to command them.—*Fr. Prov.*

Men of limited capacities generally condemn every thing that is above the level of their understandings. —*Rochefoucault.*

Perfect Subsoil Drainage and Deep Ploughing.

Every variety of good soil has a naturally dry, porous subsoil, being either a deep, friable, porous earth, sand, or gravel, or open rock; so that rain water will not rest on its surface, but readily pass through the stratum below.

The greatest injury which the land receives is from stagnant water on the surface, or between the soil and the subsoil.

Bad and worthless clay soil is generally that which is saturated by stagnant water.

If water be allowed to remain on good land, it will soon convert it into bad or worthless soil; a retentive subsoil has generally a soft or clayey surface, and is universally a bad and unproductive soil.

When the subsoil is retentive, the rain finds its way through the cultivated portions of the surface to the subsoil, and passes on slips between them to the furrows, keeping the cultivated portions of the soil wet and unfit for vegetation; but if the subsoil be porous, either naturally or artificially, it then goes directly through the subsoil or porous passage to the drains that are formed to draw off the redundant water.

It is the constant practice of the most scientific gardeners, when about to pot any plants, to put some broken tiles or gravel in the bottom of the pots to drain off the superfluous moisture from the plants to the hole in the bottom of the flower pots; and when they use a strongish or clay soil, instead of passing the soil through a sieve as formerly was the custom, they now chop it into small pieces, and thus give to strongish clay soils an artificial porousness which they naturally do not possess.

On examining the roots of plants growing in pots with soil thus prepared, we find the crevices between the broken pieces of earth full of roots, because they have not only a more easy passage where the soil is friable, in consequence of the lumps keeping the earth loose and porous between them, but here the drainage is most rapid and complete.

Land is not perfectly drained which, during the wettest weather, has any spots on it which the water rests upon, and gets stagnant for a short period; the rain should have a free course to sink down through the subsoil below the roots of plants, and then run off by the furrow-drains to the open ditches.

Complete subsoil drainage of the retentive soils can only be effected by having a drain in every furrow, or about one or at most two perches apart; and then by subsoil ploughing across the drains, and making an artificial porous stratum under the cultivated surface to within an inch or two of the stones in the drains, that the rain-water may fall through the surface and run in the subsoil to the drains. The effect produced on the crops of close retentive soils, after they have been perfectly drained and subsoil ploughed, is most astonishing.

The produce is so much increased that it will, in many instances, pay the expenses in a year or two; and wet soils, which seemed to be strong clay when wet, become friable and even light when completely subsoil-drained, are easily cultivated, and light enough for producing turnips to be fed off with sheep.

Perfect drainage and deep ploughing is the true principle of giving to the soil an increased fertility; by this means the plants are enabled readily to push their roots farther and deeper in search of food, which they obtain of a more healthy kind, than when the soil is imperfectly drained and ploughed shallow. All tenacious clay soils should be trenched or subsoil-ploughed once in every course of crops; or when they are in fallow; this practice not only gives to the roots of plants a greater scope to go in search of food in dry weather, but also furnishes a depth of porous substratum under the soil to draw off the superabundant moisture during continual wet weather, and transmits moisture to the roots of plants in continual drought.

The utility of trenching or subsoil-ploughing these soils, particularly such as have retentive subsoils, must be evident, for, if the toil on such a subsoil be well pulverized merely to the depth of the furrow slice, in continued wet weather it soon gets into a state unfit for vegetation; the water becomes stagnant, and all the soluble matter in the soil is either washed out, or locked up in the soil from being so thoroughly soaked as to exclude the air; and when it again becomes dry, it is as hard and solid a mass as bricks ready for the kiln.

In either of these states it is impossible for any plants to vegetate, the soil being at one time as soft and smooth as well tempered mortar, and at another almost as dry and hard as a stone.

But when the soil is artificially deepened by deep ploughing, and the subsoil is also made porous to much greater depth by the subsoil-plough, the rain gradually sinks down to the whole depth of the porous substratum, and from thence to the furrow drains; and in time of great drought, the deep moved ground will hold, by capillary attraction, a much greater supply of moisture for the nourishment of plants, thus draining off the abundant water during the heavy rains, and supplying the means for healthy vegetation at all times.

Complete or perfect drainage is the foundation of all improvements in husbandry; it should therefore be the first step which we take in attempting to improve or ameliorate the soil.

Land wet from springs should be drained by deep drains, so as to tap the porous stratum which contains the water at the lowest level if possible. But much the greatest part of what is called wet land, is so from its retentive subsoil, and the retentive adhesive nature of the soil, which so obstinately retains the rain that falls on it; so that the drying process is effected very slowly when compared with soil whose subsoil is either naturally or artificially porous. The working of such land is kept back, and is frequently not effected in proper time. Nature furnishes us with the principles which should direct all our operations in permanently improving soil or in cultivating it.

As we have seen that the richest and most productive soil has always a subsoil pervious to water, which carries it off as it falls by imbibing it or filtering it to a considerable depth below the active soil; so we ought artificially to make as complete a drainage of subsoils to produce the same effect by having drains from one to two perches apart to effect this, and by deep or subsoil ploughing across these drains to draw of the water to them which falls on the surface, so that the whole of the active soil may be always kept so dry as to be fit for the purposes of vegetation.

These drains must be sufficiently near each other to allow the redundant moisture to be speedily and effectually carried off by the artificial passage made at the bottom of the moved subsoil.

The distance of these drains must be regulated by the nature of the subsoil; if this be very close and impervious they should be only about one perch, but if it be to a certain degree pervious, they might be two perches apart.

Before we attempt perfectly to drain any land, we must first understand the principles of the system thoroughly, or we may only adopt certain general rules, without considering that the various kinds of subsoil will require particular modes to effect our object.

Mr. Smith of Deaneston first gave publicity to the mode of perfect drainage, and subsoil ploughing; he says, "The principle of the system is *the providing of frequent opportunities for the water rising from below, or falling on the surface, to pass freely and completely off*, and therefore the most appropriate appellation for it, seems to be, '*The frequent drain system.*'"—*Morton on Soils.*

Magnesian Lime Stone.—Almost every writer upon the use of lime in agriculture, has adopted the opinion of Tennant, that magnesian lime stone was hurtful to land; and although the practice in Pennsylvania had disproved the fact, the lime there used in agriculture abounding in magnesia, yet our own writers continue to persist in the error. "It is now asserted," says Parkes, "that lime and magnesia are both hurtful when employed in improper situations, or in excessive quanti y, but that magnesia in itself is not essentially injurious."

Preserving meat without salt.—It is the practice in Thibet to prepare their meat by extreme cold.—The process is extremely simple. They kill, clean and strip the animal of his skin; he is then placed upon his legs in a commodious place, and left exposed to a free access of frosty air, until all the juices in his body are completely dried up, and the whole becomes one uniformed stiffened substance. It is then in a fit state for carriage to any part of Thibet, and for keeping to any season of the year. No salt is used in the preparation. I had supplies of this prepared meat during all the time I remained at Geshoo Soomboo, which had been cured in the preceding winter. It was perfectly sweet, and I was accustomed to eat heartily of it, *without further dressing*, and at length grew fond of it. It had not the appearance of being raw, but resembled in colour that which has been well boiled. It had been deprived of all ruddiness, by the intense cold.—*Turner's Embassy to Thibet.*

The salt mine of Wilitska, near Cracow, in Poland, is the largest in Europe, and has been constantly worked for more than 600 years. It is at the immense depth of 740 feet below the surface of the ground on which the town stands; and it is 1,100 feet wide, and 6,700 feet in length. The mine exhibits a spacious subterraneous plain, with lofty vaulted roofs, supported by columns of salt, which have been left standing for the purpose. Here a great number of lights are constantly burning, and the blaze of these reflected from every part of the mine, which appears bright and clear as crystal, or tinged with the most beautiful colours, presents a most enchanting prospect. In these mines 1,000 men are constantly employed. The passages contain altars and chapels, in which lights are continually kept burning before the images of the saints, and some of these galleries are capacious enough for a large church to be enclosed in one of them. That part of the mine which has been most excavated, and which appears like a vast plain, is interspersed with clusters of huts belonging to the miners and their families, many hundreds of whom are born and finish their lives in this subterraneous enclosure.

Near Cordova in Spain there is a mountain of rock salt 500 feet high, and three miles in circumference. —*Park's Chem. Essays.*

He who is ambitious to be rich, wishes his desire to be accomplished as soon as possible.—*Juvenal.* Avarice produces rapacity.

Young Men's Department.

Chemical Catechism—Chapter V.

OF EARTHS.

What are the principal characters of the earths?

The earths are incombustible bodies, and in general are unalterable in the fire. Till lately, they were thought to be unsusceptible of decomposition; they are insoluble in water, or nearly so, when combined with carbonic acid, and are of a specific gravity never exceeding five times that of water.

How many earths are there?

There are nine distinct earths known at present, viz. silica, alumina, zirconia, glucina, yttria, barytes, strontites, lime and magnesia.* The four I have enumerated last, are generally called alkaline earths.

Why are some of these earths called alkaline earths?

Barytes, strontites and lime, are called alkaline, because they agree with the alkalies in taste, causticity, solubility in water, and in their effect upon vegetable colors;† magnesia agrees with the alkalies in the latter property only.

What is the nature of silica, and what are its chief properties?

Silica, or pure flint, is a white, inodorous, and insipid earth; it is insoluble in water, and in every acid except the fluoric; it endures the strongest heat without alteration; but, when mixed with soda, or potash, becomes fusible in a strong fire into glass. Its specific gravity is 2.65.

In what state is silica found native?

Silica is found in almost all mineral substances, particularly in gravel, sand, quartz and flint, of which it forms nearly the whole substance.‡ It is also the chief ingredient of those rocks which constitute the most bulky materials of the solid parts of our globe.§

What are the chief uses of silica?

Silica is the the most durable article, in the state of gravel for the formation of roads; it is a necessary ingredient in earthen ware, porcelain and cements; is the basis of glass, and of all vitrious substances; and is an indispensable article in many of our chemical furnaces and utensils.

What is the use of silica in glass making?

Silica is the chief ingredient in glass. It is rendered fusible by a due mixture of alkali, which acts as a flux to the silica, and renders the whole transparent.

Are these the only articles necessary to form glass?

In Holland, and some other parts of Europe, glass is manufactured with sand and alkali only; but in England, [and in the United States,] flint glass is made by a mixture of red lead with those substances; which gives the glass great weight, and makes it more useful for all common purposes.‖

* To a cursory observer, the earth appears indefinitely diversified; so much so, that he would probably think the different kinds innumerable. However, notwithstanding the varied appearance of the earth under our feet, of that of the furrows of the field, and of the mountainous parts of the world, whose diversified strata present to our view substances of every texture and of every shade, the whole is composed of only nine primitive earths; and as three of these occur but seldom, the *variety* which is produced by the other *six*, becomes the more remarkable. This may fairly be adduced as one instance of the infinite skill of the Deity, as it "bespeaks an artist, master of his work, acquainted with his materials."

To give a still greater variety to the works of nature, these earths are endowed with an affinity for acids and metallic oxides, whence arise the spars and gems, and precious stones, of every color and every species.

"Th' unfruitful rock itself, impregnated by Thee,
In dark retirement forms the lucid stone."

† Barytes, strontites, lime and magnesia, are found in nature always combined with acids. None of the combinations are very hard, as either of them may be scratched with a knife. The acids which are found by nature united with these alkaline earths, are generally the carbonic, (as in lime,) sulphuric, (as in gypsum,) the fluoric, (as in Derbyshire spar,) the boracic and the phosphoric.

‡ In 1760, the Emperor of Germany caused, by permission of the Grand Turk, one of the timbers which supported Trajan's bridge over the Danube, below Belgrade, to be taken up and examined. The outer part of this bridge, to the depth of half an inch, was found to be converted to an *agate;* the inner parts were slightly petrified, and the central were still wood. The agate is a mineral, composed of silica and alumina, but chiefly silica. These timbers had been buried in the waters of the Danube nearly 2,000 years.

§ A granite mountain, about thirty miles from the Cape of Good Hope, called the Pearl Diamond, rises out of the ground, to the height of four hundred feet, being half a mile in circumference, and formed of a single block of granite. Silica also constitutes two-thirds of the asbestos, so valued by the ancients for wrapping up the dead before they were committed to the funeral pile. They discovered the method of drawing the fibres of the mineral into thread, and afterwards weaving it into cloth. In consequence of its incombustibility, it preserved the ashes of the body from mixing with those of the wood, upon which it was laid to be burnt. [Samples of paper, indestructable by fire, were presented to the Conductor, some thirty years ago, by Mr. Benjamin, who then owned and managed a paper mill at Catskill.]

‖ The common bottle glass is made with a large portion of the ashes of vegetables, or soap-boiler's waste ashes, instead of pure alkali. The portion of iron, which is generally found in vegetable substances, gives it the green colour

What are the chief properties of alumina?

Alumina, or pure clay, is soft to the touch; adhesive to the tongue; emits a peculiar odor when moistened; forms a paste with water; has great affinity for coloring matter; will unite with most acids; and acquires great hardness, and contracts in the fire.* Like silica, it is soluble in caustic potash, or soda. Its specific gravity is 2.00.

In what state is alumina found native?

Alumina is distributed over the face of the earth in the form of clay, and from this circumstance, acquired the name of *argil;* it is found also in a state of crystalization in the sapphire, and other precious stones, and is united to the oxide of iron in the ochres. It obtained the name of alumina from being the base of salts called alum.

What are the chief uses to which alumina has been applied?

Alumina, on account of its aptitude for moulding into different forms, and its property of hardening in the fire, is employed in various ways, such as for making bricks, earthen ware, porcelain,† crucibles, &c. but the alumina which is made use of for these purposes, is always impure, as it is employed in the state of clay, and often as it is taken from the bowels of the earth, without any previous preparation whatsoever.

Is alumina employed in forming any direct chemical combinations?

Aluminous earth is employed for various purposes by the dyer and calico printer, especially in its combination with acetic acid, as a mordant for fixing madder reds, and some other colors, on calico; and upon the continent, it is artificially combined with sulphuric acid, in order to form alum; but we possess the compound, or alum slate, ready formed, in abundance.

Why do potters employ a mixture of alumina and silica for earthen ware?

In making earthen ware, a due proportion of both these earths are necessary; for, if alumina alone were used, the ware would not be sufficiently burnt without shrinking too much, and even cracking; and a great excess of silica would weaken the tenacity, and render the ware brittle.

What is the nature of that very hard species of pottery, called stone-ware?

Stone-ware, like other pottery, is chiefly composed of alumina and silica; but a certain quantity of old pottery, finely ground, is generally introduced into its composition. The difference, however, between this and common earthen ware, chiefly consists in the burning and glazing; stone-ware being always submitted to a much higher degree of heat, and in its being glazed with muriate of soda, (common salt,) instead of the oxide of lead. On account of the superior strength of stone-ware, its very compact texture, and the wholesome nature of its glaze, it is greatly to be wished that its use be considerably extended, and that every article for culinary purposes were to be manufactured from it.

What constitutes the difference between earthen ware and porcelain?

Porcelain is not esteemed good, unless it be very compact, quite white and semi-transparent;‡ indeed, it is chiefly the last quality that constitutes the principal difference, for *earthen* ware is always opaque.

He that would govern his actions by the laws of virtue, must regulate his thoughts by those of reason; he must keep guilt from the recesses of his heart, and remember that the pleasures of fancy, and the emotions of desire, are more dangerous as they are more hidden, since they escape the awe of observation, and operate equally in every situation, without the concurrence of external opportunities.—*S. Johnson.*

Nature is said to be a *mother* to some people, and a *step-dame* to others; but the real truth is, that providence is kind to all alike, and it is industry only that makes a difference between nations and individuals; for those who contemplate her gifts, and study how to make use of them, very rarely fail of finding their pains rewarded, even beyond their expections.—*Dr. Campbell.*

* Common clay is a mixture of alumina and silica. Fuller's earth is alumina combined with very fine silica. It is owing to the affinity which alumina has for greasy substances, that this article is so useful in scouring cloth. Hence pipe-clay is frequently used for the same purpose.

† The beautiful colors which are seen upon porcelain and earthen ware, are given by metallic oxides. Purple is given by gold; red by the oxide of iron; yellow by the oxide of silver, green by copper; blue by cobalt; and violet by manganese.

‡ Porcelain is an artificial compound of great durability. There is an octagon tower at Nankin, in China, called the porcelain tower, which is entirely covered with the most beautiful china. It is a building of nine stories, nearly 300 feet high, and each story decreases in breadth as it rises in height. It retains its beauty, though exposed to the action of the sun and weather for more than 400 years.

Choice Scraps.

To have become possessed of riches, is, to many, not the end of their miseries, but merely a change in them; the fault is not, however, in the riches, but in the mind.—*Seneca.*

There are many men who appear struggling against adversity, and yet are happy; but yet more, who, although abounding in wealth, are miserable.—*Tacitus.*

I consider that man to be undone who is insensible to shame.—*Plaut.*

Such is the affinity for water, in some earths and alkalics, that pure allumine (clay) will retain a tenth of its weight of that fluid, according to Saussure, even though it be submitted to a heat that will fuse iron. And potash, according to Darcet, submitted to a red heat, retains 13 per cent of water, and soda nearly 19 per cent.

For lineage, ancestry, and all other things which we have not ourselves acquired, can scarcely be called our own.—*Ovid.* Every man should feel more pride in acquisitions obtained by his *own* merit, than in honorary distinctions earned by his ancestors.

Nature has placed the means of happiness within every man's reach, if we did but make a proper use of her gifts.—*Claud.* It is from our abuse of those things which Providence has bestowed as blessings, that most of the calamities arise which affect mankind.

Avarice, (as also ambition and other evil passions,) when it has once passed the proper limits, knows no bounds.—*Seneca.* New gratifications only excite new desires.

Nothing flies so swiftly as calumny—nothing is so easily propagated—nothing is more readily received—nothing is more widely disseminated.—*Cicero.*

"On eagle's wings immortal scandals fly."

It is not that which is commonly considered as a woman's decory, that I estimate as such, but her chastity, modesty and controlable passions.—*Plaut.*

*Moneys received during the last month, in sums of five dollars and over. The total receipts are included from post-offices marked with an asterisk.**

	No. Vols.		No. Vols.
Appling, Jeff.	6	*Kanawha C. H.	" 38
Bethlehem,	Ct. 5	Lewisberry,	Pa. 5
*Baltimore,	Md. 97	*Middletown,	Ct. 13
*Boston,	Mass. 104	Manhattan,	Ia. 5
*Coxsackie, Gr.	23	*Newark,	O. 21
*Cincinnati,	O. 14	New-Orleans,	La. 130
*Cheraw,	S. C. 37	*New-York city,	148
*Chicago,	Ill. 19	*Newburgh, Ora.	18
Chester, Ora.	5	*Nashville,	Tenn. 129
*Cleaveland, Os.	16	*New-Brunswick,	N. J. 37
Elba,	Mich. 5	*Philadelphia,	Pa. 124
*Enfield,	Ct. 17	Preston,	Ct. 18
*Easton,	Md. 20	Port Deposite,	Md. 22
Essex, Essex,	5	*Richmond,	Va. 125
Greensborough,	Ga. 20	St. Johnsbury,	Vt. 9
*Georgetown X R'ds,	Md. 26	*Sandisfield,	Mass. 13
*Ithaca, Tomp.	13	*Terra Haute,	Ia. 44
*Johnson's Springs,	Va. 52	Toronto,	U. C. 5
Jones,	" 5	Warfieldsburgh,	Md. 9
*Jeffersonton,	" 16	Winchester,	Va. 5
Jerusalem,	" 22	*Worcester,	Mass. 7

PRICE CURRENT.

ARTICLES.		New-York. Sept. 24.	Boston. Sept. 19.	Philadelphia Sept. 22.	Baltimore. Sept. 18.
Beans, white,	per bush.	1 25 .. 1 30	1 25 .. 1 50	1 00 .. 1 12	1 00 .. 1 25
Beef,	cwt.	7 50 .. 7 75	6 50 .. 7 37	7 00 .. 9 00	7 00 .. 8 50
Bacon, western,	lb.	10 .. 12	16 .. 17	8 00 .. 10 00	15 .. 16
Butter, fresh,	lb.	18 .. 25	18 .. 25	25 .. 31	25 .. 33
Cheese,	lb.	7 .. 9	6 .. 10	6 .. 9	9 .. 10
Cotton, best,	lb.	14 .. 14	9 .. 13	9 .. 9	9 .. 12
Flour, best,	bbl.	9 50 .. 9 75	5 50 .. 8 75	7 25 .. 7 50	7 50 .. 8 00
GRAIN—Wheat,	bush.	1 90 .. 2 00	.. ..	1 75 .. 1 90	1 90 .. 2 00
Rye,	bush	1 12	.. ..	1 05	.. ..
Oats,	bush.	37 .. 42	45 .. 50	35 .. 40	40 .. 45
Corn,	bush.	1 05 .. 12	94 .. 1 00	95 .. 1 00	1 00 .. 1 05
Hams, pork,	lb.	14 .. 14	16 .. 17	10 .. 12	12 .. 12
Pork, in bulk,	cwt.	10 00 .. 11 00	11 00 .. 12 50	10 .. 11	12 .. 13
SEEDS—Red Clover,	bush.	12 00 .. 13 00	12 50 .. 13 00	.. ..	.. ..
Timothy,	bush.	2 50 .. 2 85	2 63 .. 2 75	.. ..	.. ..
Wool—Saxony fleece,	lb.	45 .. 50	50 .. 53	46 .. 50	50 .. 50
Merino,	lb.	38 .. 50	45 .. 48	33 .. 46	45 .. 50
1-4 and com.	lb.	32 .. 36	35 .. 37	.. ..	33 .. 36
Sheep,	head.	.. ..	2 88 .. 3 00	2 .. 3	2 .. 2
Cows and Calves,		.. ..	35 .. 55	10 .. 11	25 .. 30

FROM THE STEAM PRESS OF
PACKARD, VAN BENTHUYSEN & Co.